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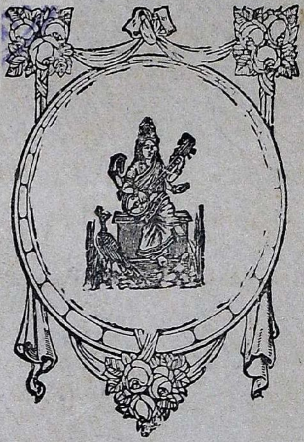

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SKANDASVĀMIN AND MĀDHAVĀCĀRYA

By

A. VENKATASUBBIAH

Skandasvāmin is the author of a commentary (*bhāṣya*) on the Ṛgvedasaṁhitā, the first Aṣṭaka of which has been published by Dr. Kunhan Raja. Mādhavācārya is the author of a commentary (*bhāṣya*) on the Sāmaveda-saṁhitā which too has been published by Dr. Raja in the Adyar Library Sanskrit Series.

The opening sentences of Skanda's commentary are almost identical with some sentences that occur in Mādhavācārya's commentary. In this connection Dr. Raja observes in the Foreword (p. vi) to his edition of the latter work—"The close similarity of the Introductory portion of the commentary with the corresponding portion in the commentary on the Ṛgveda by Skandasvāmin (edited by me in the Madras University Sanskrit Series as No. 8) cannot escape the notice of any one. The similarity is in wording, in method and in ideas. This close similarity cannot be an accident; and since the commentator mentions the Ṛgvedabhāṣya, it may reasonably be concluded that he is referring to the Bhāṣya of Skandasvāmin though he does not mention the name of Skandasvāmin". And Dr. Raja is inclined to think that Mādhava is a disciple of Skandasvāmin (p. viii) and that the former's father Nārāyaṇa is identical with Nārāyaṇa who is mentioned by Veṅkaṭa-Mādhava as having collaborated with Skanda and Udgītha in the writing of the Ṛgvedabhāṣya. This is the opinion of Pandit Sambasiva Sastri also who has edited Adh. 1 of Skanda's above-named commentary in the Trivandrum Sanskrit Series (No. xcvi)[1].

It seems to me that this opinion is ill-founded and based on a superficial comparison of Mādhava's introduction to his commentary.

The introduction to Skanda's commentary reads as follows:

1. See p. 4 of the Introduction.

मन्त्राणामवबोद्धव्यो यतोऽर्थोऽङ्गत्वसिद्धये ।
ऋग्वेदस्यावबोधार्थमतो भाष्यं करिष्यते ॥

मन्त्राः पञ्चप्रकाराः । प्रैषाः करणाः क्रियमाणानुवादिनः शस्त्राभिष्टवनगता (जपानुवचनादिगता) इति । [1]प्रैषास्तावत् 'दैव्याः शमितार आरभध्वम्' इत्येवमादयः । [2]करणाः 'इदमहमर्वावसोः सदने सीदामि' इत्येवमादयः[2] । [3]क्रियमाणानुवादिनो 'युवा सुवासा' इत्येवमादयः[3] । [4]शस्त्राभिष्टवनगता 'आ त्वा रथं यथोतये', 'ब्रह्म जज्ञानम्' इत्येवमादयः[4] । [5]जपानुष्टवनादिगताः 'तदद्य वाचः प्रथमं', 'आपो रेवतीः' इत्येवमादयः[5] । [6]एते सर्वे प्रयोगकाले स्वार्थान् प्रतिपादयन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्ते । नोच्चारणमात्रेण । कुत एतत् । ये तावत् प्रैषाः करणाः क्रियमाणानुवादिनो[6]वा[7] तेषां योऽर्थः तस्य कर्मणोऽङ्गभूतत्वात् अङ्गभूतस्यास्मृतस्य अनुष्ठातुमशक्यत्वात् स्मरणस्य करणापेक्षितत्वात् प्रैषादिभिश्च कर्तुं शक्यत्वात् । ये तु शस्त्राभिष्टवनादिगताः तेषां योऽर्थः यद्यपि कर्मणो नाङ्गभूतः तथापि ते तमेव प्रतिपादयन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्ते । नोच्चारणमात्रेण । स्तुतिर्हि शस्त्राभिष्टवनम् । गुणैश्च गुणिनः सम्बन्धप्रतिपादनं स्तुतिरित्युच्यते । न तदर्थाक्षरोच्चारणमात्रम् । न हि ग्रहणार्थमभ्यासार्थं वा स्तुत्यर्थान्यपि ऋगक्षराणि श्लोकाक्षराणि वा उच्चारयन् लोकेऽस्मिन् स्तौतीत्युच्यते । अतः शस्त्राभिष्टवनादिगता अपि स्वार्थमेव प्रतिपादयन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्ते । नोच्चारणमात्रेण । एवमेषां चतुर्विधानामपि मन्त्राणामर्थप्रत्ययेन कर्माङ्गवद्भावात् अनवबुद्धाच्च मन्त्रात्तदर्थस्य प्रत्येतुमशक्यत्वात् बोद्धव्य एषामर्थः । येऽपि जपानुवचनादिगताः तेषां यद्यपि जपिना अनुवचिना वा धातुना अक्षरोच्चारणमात्रं चोदितं नार्थप्रत्यायनं तथापि 'यो ह वा अविदितार्षेयच्छन्दोदैवतब्राह्मणेन मन्त्रेण याजयति वा ध्यापयति वा स्थाणुं वर्च्छति गर्ते वा पद्यते' इत्यार्षेयश्रुतेः अविदितदैवतस्य मन्त्रस्य कर्मण्यङ्गाभावात् अज्ञायमानार्थस्य च मन्त्रस्य दैवतस्य वेदितुमशक्यत्वात् जपानुवचनादिगतानामपि बोद्धव्य एवार्थः । एवं सर्वमन्त्राणां कर्मणोऽङ्गत्वसिद्ध्यर्थं यतो बोद्धव्योऽर्थः अतः ऋग्वेदस्यावबोधार्थं अस्माभिर्भाष्यं करिष्यते ।[7]

The sentences marked 1-1-2-2 etc., in the above passage occur in Mādhava's commentary also with some slight changes— in 1-1, 2-2, 3-3, 4-4 and 5-5; in 3-3, there is इति instead of इत्येवं the words परिवीत आगात् occur after सुवासाः; in 4-4, स्तोत्रशस्त्र instead of शस्त्राभिष्टवन, in 5-5, जपानुवचन instead of जपानुष्टवनादि and the word मसीय after प्रथमं and in 6-6, स्वार्थं instead of स्वार्थान्. Then there occurs in Mādhava's commentary the following passage which expresses the same idea as the passage marked 7-7- in Skanda's commentary :—

तेषां योऽर्थः स कर्मणोऽङ्गत्वं प्रतिपद्यते । अङ्गं चानुष्ठातव्यम् । न चास्मृतमनुष्ठातुं शक्यते । अतः कर्मणोऽङ्गस्मरणमपेक्षितम् । तच्च प्रैषादिभिः शक्यते कर्तुम् । अतः प्रैषादयस्तावत् प्रयोगकाले स्वार्थं प्रतिपादयन्तः [कर्मणोऽङ्गत्वं] प्रतिपद्यन्त इति । येऽपि स्तोत्रशस्त्रगतास्तेषामर्थो यद्यपि कर्मणोऽङ्गत्वं न प्रतिपद्यते तथापि तमेवार्थं प्रत्याययन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्ते । कथम् । स्तुतिर्हि स्तोत्रशस्त्रशब्देनाभिधीयते । स्तुतिश्च का । गुणिनः प्रस्तावात् प्रयोगकाले स्वार्थं प्रतिपादयन्तः गुणैः सम्बन्धप्रतिपादनम् । न गुणपदानामुच्चारणमात्रम् । कुत एतत् । लोके हि अभ्यासार्थं गुणपदाना-मुच्चारणं यः करोति तस्य स्तौतीति व्यपदेशाभावात् । अतः स्तोत्रशस्त्रगता अपि मन्त्राः स्वार्थमेव प्रतिपादयन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्त इति । येऽपि जपानुवचनगतास्तेषां यद्यपि जपिना वचिना वा धातुना उच्चारणमात्रं चोदितं तथापि सति अर्थं प्रत्याययन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्ते । कथम् । 'यो ह वा अविदितार्षेयच्छन्दो......गर्तं वा पद्यते' इत्यार्षेयश्रुतेः अविदित-दैवतस्य मन्त्रस्य कर्मणि विनियोगः प्रतिषिध्यते । न च अविज्ञातार्थस्य ऋषिदैवतं शक्यं विज्ञातुम् । परिज्ञाने च गुणः श्रूयते । 'अथ यो मन्त्रे मन्त्रे वेद स सर्वमायुरेति य एवं वेद' इत्येवमादिभिर्वाक्यैः परिज्ञानं प्रशस्यते । तस्मात्तेऽपि स्वार्थप्रत्यायनेनैव कर्मणोऽङ्गत्वं प्रतिपद्यन्त इत्युपपन्नम् । एवं मन्त्राणां कर्मणोऽङ्गत्वप्रतिपादनार्थं बोद्धव्योऽर्थो यस्मात् तस्माद्भाष्यं प्रस्तूयते । After this passage of Mādhava's commentary there follows the passage: ये च साम्नां स्तोभप्रकारविशेषा आशास्ति स्तुतिसङ्ख्यानादयः तेऽपि स्वार्थं प्रतिपादयन्तः कर्मणोऽङ्गत्वं प्रतिपद्यन्ते। तथा तेषां स्तोभानामुद्देशतः स्वरूपमुच्यते । [here follow fifteen lines in which are described in brief *āśāsti*, *stuti*, *saṁkhyāna*, etc.] एवं सर्वस्तोभानां बोद्धव्योऽर्थो यस्मात् तस्मात् साम्नां केषाञ्चिद्भाष्यं प्रस्तूयते [here follows the *Vyākhyā* of some Sāmans in nineteen lines] एवं सर्वसाम्नां ये त्रयोदशविधाः स्तोभाः ते समासतो व्याख्याताः । पञ्चाग्निना माधवेन श्रीनारायणसूनुना । सवितुः परां भक्तिमालम्ब्य तत्प्रसादाद्भाष्यं कृतम् ।

Mādhava's commentary begins with the stanza, रजोजुषे जन्मनि etc., which is the first benedictory stanza of Bāṇa's *Kādambarī* and continues as follows:

षट्त्रिंशत्प्रकारा मन्त्राः । प्रैषाः करणाः क्रियमाणानुवादिनः स्तोत्रशस्त्र-गता जपानुवचनगताश्च । एते पञ्चप्रकारा ऋग्व्याख्यायां भवन्ति । अन्ये सामव्याख्यायामुच्यन्ते ।

प्रस्तावश्च तथोद्गीथः प्रतिहारोपद्रवस्तथा ।
निधनं पञ्चमं चाहुर्हिङ्कारं प्रणवमेव च ॥

आशास्तिस्तुतिसङ्ख्यानं प्रलापः परिदेवनम् ।
प्रैषमन्वेषणं चैव सृष्टिराख्यानमेव च ॥

सप्तधा गेयमेकेषामन्ये षोडशधा विदुः ।
पञ्चविधं तु सर्वेषामध्वरार्थं प्रचक्षते ॥

अन्येऽपि स्तोत्रप्रकारा *अयं वाव लोको हा ऊकारो वायुर्हा इकारश्चन्द्रमा अथकारः । आत्मेहाकारः अग्निरीकारः आदित्य ऋकारः निहव एकारः विश्वेदेवा अहो ईकारः प्रजापतिर्हिङ्कारः प्राणाः स्वरोऽन्नं या वाग्विराट् । अनिरुक्तस्त्रयोदशसञ्चरो हुंकारः । *एते षट्त्रिंशत्प्रकाराः सामव्याख्यायां भवन्ति । साम्नां च प्राधान्यमस्मिन्वेदे । यतः स्तोत्राणि तानि ॥

It will be seen that both Skanda and Mādhava, have, in the Introductions to their commentaries, followed the same line of reasoning. They lay stress on the fact that the understanding of the meaning of mantras is a necessary part of the rite, that one should not employ a *mantra* in any rite without knowing its meaning, and that hence one should know the meaning of *mantras* and they announce that they will therefore expound the meaning of *mantras* in their *bhāṣya*.

It will be also seen that the wording of some of the sentences occurring in the two commentaries is identical, and that, as observed by Dr. Raja, this identity of wording is not due to accident but to conscious borrowing by one of the two commentators from the other[1]. According to Dr. Raja, it is Mādhava who is the borrower. The basis for this opinion is his belief that Mādhava's father Nārāyaṇa is the same as the Nārāyaṇa who is said to have collaborated with Skanda in the writing of the Ṛ̣V. commentary. There is however not the slightest foundation for such a belief.

Another reason for Dr. Raja's above opinion is his belief that Mādhava 'mentions the Ṛgvedabhāṣya' and 'it may be reasonably concluded that he is referring to the Bhāṣya of

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**This passage is *Chānd. Upa.* 1, 13, 1-3. This is not shown as a quotation in Dr. Raja's edition. There are several errors in it as compared with the *Upa.*; I have not attempted to correct them, but have re-produced here the passage as printed in the edition by Dr. Raja.

1. There is also the possibility of both these writers having borrowed from a common source. We know however of no such common source and can hence leave such a possibility out of consideration.

Skanda though he does not mention the name of Skanda.' This belief too is unfounded. What is mentioned by Mādhava is not 'Ṛgvedabhāṣya' but 'Ṛgvyākhyā' (see p. 3, 4th line from bottom); and this expression refers to the explanation of *ṛks* known as *prakṛti-ṛks* that number 585 and occur in the Sāmavedasaṁhitā along with *prakṛti-sāmans* that exceed 1000 in number. Compare in this connection the following passage from Bharatasvāmin's Sāmavedasaṁhitā-bhāṣya (p. 99):

(P. 99) इत्थं चतुर्दशशतमृच आग्नेयपर्वणि ।
व्याख्यच्छ्रीभरतस्वामी श्रीरङ्गायतने वसन् ॥
(P. 348) शतानि त्रीण्यृचामैन्द्रे द्विपञ्चाशदृचोऽधिकाः ।
इत्थं श्रीभरतस्वामी काश्यपो व्याकरोदिमाः ॥

(P. 410) एकोनविंशतिशतं पवमान इतीरिताः ।
शतानि पञ्चाशीतिश्च पञ्च चाप्यखिला ऋचः ॥
इत्थं श्रीभरतस्वामी काश्यपो यज्ञदासुतः ।
नारायणार्यतनयो व्याख्यत्साम्नामृचोऽखिलाः ॥

इति श्रीभरतस्वामिनः कृतौ सामवेदसंहिताभाष्ये ऋचां विवरणम् ।

and the following stanza at the beginning of the commentary:

नत्वा नारायणं देवं तत्प्रसादवाप्तधीः ।
साम्नां श्रीभरतस्वामी[2] काश्यपो व्याकरोत्यृचः ॥

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2. Pandit Bhagavad Datta (वैदिकवाङ्मय का इतिहास, I, 2, p. 135) citing the following stanza:

Hosalādhīśvare pṛthvīṃ Rāmanāthe praśāsati |
vyākhyā kṛteyaṃ kṣemeṇa Śrīraṅge vasatā mayā ||

from the SV. commentary of Bharatasvāmin, says that he lived in Śrīraṅgapaṭṭaṇa [this is near Mysore, and was, later the capital of the Vijayanagara viceroys and of the rulers of Mysore] during the reign of Rāmanātha (A.D. 1272-1310). This is wrong. Śrīraṅgam, mentioned by Bharatasvāmin is the well-known place of pilgrimage of that name near Trichinopoly. Rāmanātha was the son of the Hoysala emperor Someśvara (1233-54) who, even when he was living, made over the northern part of his kingdom to his eldest son Narasiṁha, the southern part (which included the Tamil country) to his son Rāmanātha, to rule. Rāmanātha's capital was Kaṇṇanūr near Trichinopoly and he ruled his kingdom till his death in A.D. 1295 when he was succeded by Ballāla III son of the above-mentioned Narasiṁha. See Rice, *Mysore and Coorg from Inscriptions*, p. 97.

The expression *ṛk* in all these passages refers to the *prakṛti-ṛks* (*yoni-ṛks*) of the Sāmavedasaṁhitā. This is the case with the word *ṛk* in the expression *Ṛg-vyākhyā* used by Mādhava. *Ṛk* here refers to the *prakṛti-ṛk* (*yoni-ṛk*) of the Sāmaveda-saṁhitā; and the term *Ṛg-vyākhyā* denotes the explanation of the *ṛks* in the SV. and not (as believed by Dr. Raja) the 'commentary on the Ṛksaṁhitā' of Skanda or any other person.

The *prakṛti-ṛks* are those contained in the Pūrvārcika of the SV. Their number is 585 according to the above-cited stanza of Bharatasvāmin; the Ajmere edition of the SV. however contains 640 verses while, according to Pandit Bhagavad Datta (*op. cit.*, I, i, p. 211) the Jaiminīya-saṁhitā contains 642 verses.

Mādhava begins his SV. commentary with the observation: "Mantras are of thirty-six kinds. Five of these kinds, *viz.* Praiṣa, Karaṇa, Kriyamāṇānuvādin, Stotraśastragata and Japānuvacanagata, are (treated) in the exposition of *ṛks*. The others are treated in the exposition of the Sāmans"; he then mentions the various kinds of Sāmans, describes the nature of Praiṣa and the other four kinds of *mantras*, explains how knowledge of their meaning is a necessary part of the rite, and then expounds briefly the meaning of some Sāma-mantras. Skanda begins his commentary with the observation, "Mantras are of five kinds-Praiṣa, Karaṇa, Kriyamāṇā-nuvādin, Stotraśastragata, Japānuvacanādigata." He describes the nature of these five kinds, and shows that the knowledge of their meaning is a necessary part of the rite. The words used by him in this connection are almost the same as those used by Mādhava in his commentary.

Thus Mādhava's exposition is concerned with 36 kinds of *mantras* while Skanda's exposition is concerned with five only of these 36 kinds. It seems therefore legitimate to conclude that Skanda has borrowed from Mādhava and not *vice versa*.

In *JOR.* x. 205 ff. I have shown that Skanda himself calls his ṚV. commentary as *Ṛgarthāgamasaṃhṛti*, 'epitome of the commentaries on the Ṛg.-Veda' which means that he has borrowed explanations from his predecessors. It is thus very likely that the sentences in his introduction to his ṚV. commentary are borrowed from Mādhava. This seems to be the

case with his explanations of the following four ṚV. verses also which are very similar to those of Mādhava in his SV. commentary. I reproduce here below these explanations as also those of Sāyaṇa by way of contrast.

(1) ṚV. 1, 7, 1: उप त्वाग्ने दिवेदिवे

दोषावस्तर्धिया वयम् ।

नमो भरन्त एमसि ॥

Skanda:—उपेत्युपसर्गः इमसीत्यनेनाख्यातेन सम्बन्धयितव्यः । त्वा[त्वां] हे अग्ने दिवेदिवे अहन्यहनि दोषावस्तः । दोषेति रात्रिनाम । वस आच्छादने । रात्रौ स्वेन ज्योतिषा तमसामाच्छादयितः । धिया यादृश्यस्माकं प्रज्ञाता दृश्या वयं नमः स्तुतिं भरन्तः । 'हृञ् हरण' इत्येतस्यैवैतत् । भत्वं 'हृग्रहोर्भश्छन्दसि' इति । हस्य भः । हरन्तः प्रापयन्तः स्तुतिं कुर्वन्त इत्यर्थः । त्वा त्वां उप एमसि । आङत्र धात्वर्थानुवादी । उपागच्छामः ॥

Mādhava (SV. 1,2,4):—उपेत्ययमुपसर्गः एमसीत्याख्यातेन सम्बन्धयितव्यः । त्वा त्वां हे अग्ने दिविदिवे अहन्यहनीत्यर्थः । दोषावस्तः । दोषेति रात्रेर्नाम । वस्ता आच्छादयिता । रात्रौ यः स्वेन ज्योतिषा तमांस्याच्छादयति स दोषावस्ता । तस्य सम्बोधनं हे दोषावस्तः । रात्रौ स्वेन ज्योतिषा तम आच्छादयितरित्यर्थः । धिया स्वया प्रज्ञया । नमः । नमःशब्दः स्तुतिवचनः । स्तुतिं भरन्तः हरन्तः प्रापयन्त इत्यर्थः । उप एमसि उपागच्छामो वयम् ॥

Sāyaṇa (ṚV. 1, 1, 7):—हे अग्ने वयं अनुष्ठातारः दिवेदिवे प्रतिदिनं दोषावस्तः रात्रावहनि च धिया बुद्धया नमः भरन्तः नमस्कारं सम्पादयन्तः उप समीपे आ एमसि त्वामागच्छामः ॥

(2) ṚV. 1, 11, 4: पुरांभिन्दुर्युवा कवि

रमितौजा अजायत ।

इन्द्रो विश्वस्य कर्मणो

धर्ता वज्री पुरुष्टुतः ॥

Skanda—पुरांभिन्दुः असुरपुराणां भेत्ता । युवा तरुणः । कविर्मेधावी । अमितौजाः अपरिमितबलः । अजायत जन्मत एव प्रभृति ईदृश इत्यर्थः । कः । इन्द्रः । कीदृशः । विश्वस्य कर्मणः धर्ता सर्वस्य कर्मणो धारयिता यावद्धि किञ्चित् कर्मास्य साधारणं वृष्टयायत्तं । वृष्टिश्चेन्द्रायत्ता । अतो वृष्टिद्वारेण सर्वस्य कर्मणो धारयितेन्द्रः । वज्री वज्रवान् । पुरुष्टुतः बहुभिः स्तुतः ॥

Mādhava (SV. 4, 7, 8) :—पुरां भिन्दुरसुरपुराणां भेत्ता । युवा तरुणः । कविर्मेधावी । अमितौजा अपरिमितबलः । अजायत जातः । जन्म-प्रभृति ईदृश इत्यर्थः । कः । उच्यते । इन्द्रः । विश्वस्य सर्वस्य । कर्मणः दर्शपौर्णमासादेः । धर्ता धारयिता । कथम् । सर्वस्य कर्मणः वृष्ट्यायत्तत्वात् । वृष्टेश्च इन्द्रायत्तत्वात् । वज्री वज्रवान् । पुरुष्टुतः बहुभिर्यजमानैः स्तुतः ॥

Sāyaṇa (ṚV. 1, 11, 4) :—अयं इन्द्रः उच्यमानगुणयुक्तः अजायत सम्पन्नः । कीदृशगुणक इति तदुच्यते । पुरां असुरपुराणां भिन्दुः भेत्ता युवा कदाचिदपि वलीपलितादिवार्धकरहितः कविः मेधावी अमितौजाः प्रभूतबलः विश्वस्य कर्मणः ज्योतिष्टोमादेः धर्ता पोषकः वज्री यजमानरक्षणार्थं सर्वदा वज्रयुक्तः पुरुष्टुतः बहुविधे तत्तत्कर्मणि स्तुतः ॥

(3) ṚV. 1, 19, 1: प्रति त्यँ चारुं मध्वरं
गोपीथाय प्रहूयसे ।
मरुद्भिं रग्न आ गहि ॥

Skanda:—प्रतिशब्दो लक्षणे कर्मप्रवचनीयः । त्यच्छब्दस्तच्छब्दपर्यायः । तच्छब्दश्रुतेः योग्यार्थसम्बन्धो यच्छब्दोऽध्याहर्तव्यः । योऽयमस्माभिः प्रकल्पितः तं प्रति । कीदृशम् । चारुं शोभनम् । अध्वरं यज्ञम् । गोपीथाय । सोमोऽत्र गौरुच्यते । सोमपानाय । प्रहूयसे प्रकर्षेणाहूयसे । एतज्ज्ञात्वा मरुद्भिः सह हे अग्ने आगहि ॥

Mādhava (SV.1,2,6):—प्रतीत्येष लक्षणे कर्मप्रवचनीयः । त्यंशब्दः तच्छब्दपर्यायः । तच्छब्दश्रुतेश्च योग्यार्थसम्बन्धो यच्छब्दोऽध्याहर्तव्यः । योऽयमस्माभिः प्रकल्पितो यज्ञः तं प्रति । चारुं शोभनम् । अध्वरं गोपीथाय । गोशब्देनात्र सोम उच्यते । तस्य पानार्थम् । प्रहूयसे प्रकर्षेणाहूयसे मया । एतत् ज्ञात्वा मरुद्भिः सह हे अग्ने आगहि आगच्छ ॥

Sāyaṇa (RV.1,19,1):—त्यच्छब्दः सर्वनामतच्छब्दपर्यायः । हे अग्ने यो यज्ञः चारुः अङ्गवैकल्यरहितः त्यं तथाविधं चारुमध्वरं प्रतिलभ्य गोपीथाय सोमपानाय प्रहूयसे प्रकर्षेण त्वं हूयसे । तस्मात् तस्मिन्नध्वरे मरुद्भिः देवविशेषैः सह आगहि आगच्छ ॥

(4) ṚV. 1, 8, 1: एन्द्रं सानसिँ रयिँ
सजित्वानं सदा सहम् ।
वर्षिष्ठ मूतये भर ॥

Skanda—आ इत्युपसर्गो भरेत्यनेनाख्यातेन सम्बध्यते । हे इन्द्र सानसिम् । वन षण सम्भक्तौ । सम्भजनीयम् । रयिं धनं सजित्वानं

सहभूतानामपि शत्रूणां जेतृ सदासहम् । षह मर्षणे । अभिभवे छन्दसि । सर्वदा चाभिभवितृ वर्षिष्ठं वृद्धतमं अत्यन्तबहु । ऊतये तर्पणायास्माकं आभर आनय देहीत्यर्थः ॥

Mādhava (SV. 2, 4, 5): आ इत्ययमुपसर्गो भरेत्याख्यातेन सम्बन्धयितव्यः । हे इन्द्र सानसिम् । वन षण सम्भक्तौ इत्यस्येदं रूपम् । सम्भजनीयं रयिं धनं सजित्वानं सहभूतानां शत्रूणां जेतृ । सदा सर्वदा च सहं अभिभवितृ । वर्षिष्ठं अतिशयेन प्रवृद्धं ऊतये रक्षणाय आभर देहीत्यर्थः ॥

Sāyaṇa (ṚV. 1, 8, 1): हे इन्द्र ऊतये अस्मद्रक्षार्थं रयिं धनं आभर आहर । कीदृशं रयिम् । सानसिं सम्भजनीयं सजित्वानं समानशत्रुजयशीलम् । धनेन हि शूरान् भृत्यान् सम्पाद्य शत्रवो जीयन्ते । सदासहं सर्वदा शत्रूणामभिभवहेतुं वर्षिष्ठं अतिशयेन वृद्धं प्रभूतमित्यर्थः ॥

The word *samūḍham* which occurs in pāda c, *samūḍham asya pāṁsure* of ṚV. 1, 22, 17 is explained by Skanda first as *samūḍham samyak ūḍhaṃ samyak pratiṣṭhāpitam*; later, he refers to 'some' who derive it from *sam+muh* and explains it as *channam-kecit tu sam-ūrvasya muher rūpam iti samūḍhaṃ channaṃ...tatra yat khe vaidyutasya padaṃ tat channaṃ nityaṃ na dṛśyate.* In Mādhava's commentary on SV. 3, 3, 9, the word is explained as *vaher idaṃ rūpaṃ saṁyak sthāpitaṃ supratiṣṭhāpitaṃ* first and then *athavā samūḍhaṃ iti muher mohanārthasya rūpaṃ, sammūḍhaṁ saṁchannaṃ yad asya vaidyutātmanā samūḍhaṃ saṁchannaṃ.* Other explanations of *samūḍhaṃ* are *saṁgataṃ* (Veṅkaṭa-Mādhava on ṚV. 1, 22, 17), *samyag ūḍhaṃ ṣamavasthāpitaṃ...samyag ūḍhaṃ prāpitaṃ, anye punar āhuḥ...(yat padaṃ vidyud-rūpaṃ tad eva) samūḍhaṃ sammūḍham kāraṇānityatvān na dṛśyate* (Bhāskara on TS. 1, 2, 13, 1) and *samūḍhaṃ antarhitaṃ avijñātaṃ...pāṃsula iva pradeśe nihitaṃ na dṛśyate tat samūḍhaṃ iti draṣṭavyam iti vākya-śeṣaḥ* (Uvaṭa on VS. 5, 15). In Nirukta 12, 19, Yāska explains the pāda as *āpyāyane-'ntarikṣe padaṃ na dṛśyate* which Durga explains as *āpyāyane-'ntarikṣe sarva-bhūta-vṛddhi-hetau yaṁ mādhyaṁ-dinaṃ padaṃ viṣṇupadākhyaṃ antarhitaṃ na nityaṃ dṛśyate|tad uktaṃ| svapnam etat madhyamaṃ jyotir anitya-darśanam iti.*

The derivation from *sam+muḥ* and the meaning *saṁchannaṃ* are found in Mādhava's commentary only and hence it seems fairly certain that Skanda's above-cited word *kecit tu saṃ-pūrvasya muher rūpam iti|samūḍhaṃ channam* refer to Mādhava's explanation in the SV. commentary.

Sāyaṇa's explanations of *samūḍham* are *samyag antarbhūtam* (ṚV. 1, 22, 17; TS. 1, 2, 11, 1; VS. (Kāṇva) 5, 15; SV. I, 2, 11, 9; II, 8, 2, 5, 1); *gṛhītam sammitam* (Śata. Br. 3, 5, 3, 13); *samyag avasthāpitam samākṛṣṭam vā* (AV. 7, 26, 4). Mahīdhara explains it (VS. 5, 15) as *samyag antarbhūtam. . avijñātam.*

The name Mādhavācārya (it is pointed out by Pandit Sambasiva Sastri on p. 5, *op. cit.*, Introd.) occurs in the stanza *dvayos tvaśve tathā hyāha Skandasvāmy ṛkṣu bhūriśaḥ Mādhavācārya-sūriś ca ko adyety ṛci bhāṣate* of the Nānārthārṇavasaṁkṣepa (Vol. I, p. 8) of Keśavasvāmin (c. 1300 A.D.). It is the opinion of that scholar that the reference is to Veṅkaṭa-Mādhava and his explanation (of the mantra *ko adya yuṅkte*, ṚV. 1, 84.16) in the Ṛgarthadīpikā. But the same explanation[3] of the word *gāḥ* is found in the SV. commentary (4, 5, 10) of Mādhava also; and since the name Mādhavācārya is that used by him in the SV. commentary while the name used in the Ṛgarthadīpikā is *Mādhava* and not *Mādhavācārya*[4], there seems to be no doubt that it is the SV. commentator who is referred to by Keśavasvāmin. Thus c. 1300 A.D. is the lower limit for Mādhavācārya and c. 650 A.D. (date of Bāṇa's Kādambarī) the upper limit.

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3. The same explanation is given by Skanda, Mādhava and Sāyaṇa also in their commentaries on the ṚV. and by Bharatasvāmin in his commentary on SV. 4, 5, 10.

4. As pointed out by me in *JOR.* xvi, 117, the name Mādhavācārya found in a copy at the end of the work is a corruption of the name Mādhavārya.

Anantācārya, (c. 1700 A.D.) writes in his commentary on the VS.:

> Vyākhyātā Kāṇvaśākhīya-saṁhitā-pūrva-viṁśatiḥ |
> Mādhavācārya-varyeṇa spaṣṭīkṛtya na cottarā ||

(see Bhagavad Datta, *op. cit.* I, part 2, 101. As the mantra *ko adya yuṅkte* does not occur in the VS. (Kāṇvasaṁhitā), Keśavasvāmin's above-cited stanza cannot refer to this Mādhavācārya.

A SANSKRIT INSCRIPTION OF THE TIME OF RĀJĒNDRA CHŌḶA I FROM TIRUVOṞṞIYŪR

By

P. R. SRINIVASAN, *Ootacamund*

The inscription,[1] the contents of which are discussed here, is engraved on the south base of the central shrine of the Ādhipurīśvara temple at Tiruvoṟṟiyūr, Saidapet Taluk, Chingleput District, Madras State. This text of the inscription has been published already in *South Indian Inscriptions* (Text), Volume IV, General No. 553, p. 185, although here the findspot of this is given as the west and south walls of the second *prākāra* of the temple. As the particulars contained in this epigraph are of architectural interest, they are brought to the notice of the scholars interested in the subject.

Tiruvoṟṟiyūr, at a distance of about 10 kilometres to the north of Madras city, has been one of the important places of Tamilnad throughout the ages and has been the scene of activity of great Śaiva saints like Sundaramūrtināyanār and great *ācāryas* like Śaṅkara.[2] The existence of a number of ancient vestiges testifies to the antiquity of the place. Of these, the large number of inscriptions engraved on the walls of the shrine and the *prākāras* as well as those that have been fitted into the floor at various places within the temple form the most important group which throws a flood of light on the history of the place of which the pivot was the temple. These inscriptions speak of the various endowments made to the temple from time to time by different categories of people and about addition, alteration and modification made to the different groups of structures in the temple. From the inscriptions belonging to the time of such later Pallava kings as Aparājitavarman,[3] Nṛipatuṅgavarman[4] and Kampavarman[5] it

1. *A.R.Ep.* for 1912, No. 126; is perhaps the same as *A.R.Ep.* 1892, No. 105. (Vide *SII*, Vol. IV, No. 553).

2. See *Ep. Ind.* Vol. XXVII, pp. 296-300, especially the footnotes on p. 300.

3. *A.R.Ep.* for 1912, Nos. 158, 159, 161, 163, etc.

4. *Ibid*, No. 162.

5. *Ibid.*, Nos. 174, 189, etc.

is clear that the temple was flourishing during the period between the late 9th century and early 10th century. The existence of a number of records belonging to the reign of Chōḷa Parāntaka I[6] (907-955 A.D.), Rāshṭrakūṭa Kannaradēva[7] (*i.e.* Kṛishna III, accession 939 A.D.) and of Uttamachōḷa[8] and Rājarāja-chōḷa I[9] proves beyond doubt the continued prosperity of the temple. Similarly, there are records here of kings and others belonging to subsequent centuries also. But it is significant to note that almost all the inscriptions belonging to the time of Rājarāja-chōḷa I and to earlier time, are on loose slabs which are now found paved on the floor of the varandah round the central shrine of the temple. They are, of course, engraved on stone slabs, a fact which shows that they formed part of a structure which was, at a later date, pulled down. Probably the uninscribed stone-slabs were refused for building the new structure while the inscribed ones were fortunately preserved by using them as paving stones. The original structure to which these stone-slabs belonged was in all probability the central shrine itself. From the nature of the contents of some of the later-day inscriptions, it is seen that during these periods, only additions or repairs were made to the other parts of the temple and there is hardly any epigraph mentioning repairs etc., conducted to the central shrine proper. It is only the inscription under examination here which speaks of the building of the central shrine. Since it belongs to the time of Rājēndra-chōḷa I, it is clear that during this king's time, the old structure was dismantled and a new structure was raised in its place.

The form or shape of the old structure was most probably the same as that of the existing shrine which is apsidal, although it is not possible to say confidentally about its size. From the absence of inscriptions of later date speaking of any alterations or repairs effected to this structure, it is easy to infer that the existing central shrine has been standing intact since the time of Rājēndra-chōḷa I.

The characters of the inscription are Grantha which are regular for the early part of the 11th century. This palaeogra-

6. *Ibid.*, Nos. 160, 164, 165, 167-170, etc.
7. *Ibid.*, Nos. 177 and 181.
8. *Ibid.*, No. 166.
9. *Ibid.*, No. 172.

phical feature coupled with the presence of other inscriptions also of the same period alongside of this inscription, forms the basis for the identification of the king as Rājēndra-chōḷa I (1012 A.D.—1044 A D.) in spite of the fact that the inscription does not contain any other particular such as date, the *praśasti* etc., characteristic of the records of the king's period. The inscription is in Sanskrit and comprises two verses only. The object of it is to record the construction of the *Śrī-vimāna* (i.e , the central shrine), with a variety of embellishments, of Śaṁbhu, also called Dēvēśa and Ādhipurīśvara (i.e. Śiva) at Ādhipuri (i.e., the modern Tiruvoṟṟiyūr) by Vīrachōḷa Ravi, the *taksha* (literally carpenter, but here the architect)[10]. The work is stated to have been done by the favour of Rājēndra, son of Rājarāja, evidently Rājēndra-chōḷa I, son of Rājarāja-chōḷa I, and as directed by Chaturānana, obviously the then head of the *Śaiva-maṭha* established at the place in the middle of the 10th century by Vellaṅkumāra, who assumed the name of Chaturānana-paṇḍita on his becoming the head of the *maṭha*, a name which came to be borne subsequently by the successive heads of the *maṭha*[11].

The terms employed to describe the various parts of the newly built shrine mentioned in the inscription are noteworthy. First of all, the material used in the construction is stated to be several black stones (*ati-bahulatarair=aśmabhiḥ kṛishṇa-varṇṇaiḥ*), i.e., several slabs of stone of the variety of rock called gneiss.[12] We know that even from the time of Āditya I, several shrines which were originally probably built of perishable material came to be rebuilt of stones.[13] In an inscription[14] from Grāmam, Tirukkoyilūr Taluk, South Arcot District, belonging to Parāntaka-chōḷa's 36th year (943 A.D.), it is expressly mentioned that the Śiva temple at Mauli-grāma or Tirumuḍiyūr on the banks of the Peṇṇār was

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10. In Tamil he is called *kal-tachchaṉ* meaning stone-carpenter (*i.e.*, architect).

11. *Ep. Ind.*, Vol. XXVII, p. 297, Dr. V. Raghavan, Tiruvoṟṟiyūr Inscription of Caturānana Paṇḍita.

12. Even now this variety of stone is called in Tamil as *karuṅkal* which seems to have been translated into Sanskrit as *aśmabhiḥ kṛishṇa-varnnaiḥ*.

13. *The Cōḷas* (1955 edition) p. 196.

14. *A.R.Ep*,, 1905, No. 735.

built of stone by Vellaṁ-Kumāraṉ, the general of Rājāditya.[15] But the mention made of the special variety of the stone in the inscription under study is interesting and it is well in accord with the use of the technical terms used for the various parts of the shrine in the inscription.

Next the size of the *vimāna* or shrine is given as *tritala* (i. e. three-storeyed); and it is said to have been built without any fault or defect.

Then comes the series of terms describing the various parts of the construction, which are of special interest, *Bahuvidha-charaṇaḥ*, literally several kinds of feet, but here it means the various types of pillars and pilasters[16]; *Tōraṇaiḥ*, with several arches[17]: *Kūṭa-kōshṭhāiḥ*, with several peaks (i.e. peaked shrine-like parts) and compartments or pavilions[18]: *Nīḍaiḥ*, with many nests (i.e., with a number of cage-like designs with rounded back, seen between *śālās* and *kūṭas*, also called *pañjaras*)[19]: *Mṛigapati-vadanaiḥ*, with several lion-faces *Nāsikādyaiḥ*, with several nose-shaped designs or vestibules[20] and other details. If the expression *dabhrair=adabhraiḥ* which means small and strong, occurring after *nīḍaiḥ*, is taken to qualify each one of the above-mentioned terms, then it will follow that the various elements of architecture detailed above, though done in miniature form were strong. This goes well with the manner in which these elements have been done in the central shrine under consideration and also are usually made.

From the foregoing, it can be seen that this is one of the rare examples of ancient Indian epigraphs containing several technical terms of architectural interest as obtained in South India in the first of half of the 11th century.

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15. *A.R. A.S.I.*, 1905-06, p. 182 ; *Ep. Ind.*, Vol. XXVII, f.n. 3 of p. 294 and f.n. 1 of p. 295.

16. P. K. Acharya, *A Dictionary of Hindu Architecture*, p. 194, s.v. *charaṇa*.

17. *Ibid.*, pp. 246 ff. s.v. *tōraṇa*.

18. *Ibid.*, pp., 144-45, s.v. *kūṭa* and *kūṭa-kōshṭha*.

19. *Ibid.*, pp. 325-26, s.v. *nīḍa* and p. 328, s.v. *pañjara*.

20. *Ibid*, pp. 318-19, s.v. *nāsikā*.

TEXT[21]

(Line 1) Svasti śrī || Takshṇ=aitatch=chhrī-vimānam bahu-
vidha-charaṇais=tōraṇaiḥ kūṭa-kōshṭhai [r]=
nnīḍair=dabhrair =adabhrair =mṛigapati-vada-
nair=nnāsik-ādyair=vvichitram
[| *] Dēvēśasy=Ādhipuryām=ati-

(Line 2) bahulatarair=aśmabhiḥ kṛishṇa-varṇṇai Rājēnd-
rasya prasādāt kṛtam=iha Raviṇā Rājarājasya
sūnōḥ: ೭ Chaturānana-chōditēna tēna tri-tala-
nnirggata-dūshaṇa[ṁ] vimānam
[| *] Raviṇ=Ādhi-

(Line 3) purīśvarasya Śambhōḥ kṛtam=etad=vara-Vīra-
chōḷa-takshṇā ||

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21. From impressions.

THE KUPPUSWAMI SASTRI RESEARCH INSTITUTE

THE TWENTIETH FOUNDATION DAY

30—3—1965

The 20th Annual General Body Meeting of the Kuppuswami Sastri Research Institute was held on 30th March, 1965 at 5 P.M. at the Vivekananda College, Mylapore.

The Annual Report of the working of the Institute for the period ending 31st July, 1964 was read and adopted and the Audited Statement of Accounts for the same period was passed. The auditor for the year commencing from 1st August, 1964 to 31st July, 1965 was also appointed.

1—4—1965

The 20th Foundation Day of the Kuppuswami Sastri Research Institute was celebrated on 1st April, 1965 at 6-30 P.M. at the Vivekananda College, Mylapore.

After prayer, Dr. Raghavan read the messages received from Sri K. M. Munshi, Sri Nittoor Srinivasa Rao, Prof. Vissa Appa Rao, Sri S. Aravamuda Iyengar, Sri J. Rama Rao and the Indian Institute of World culture.

Sri K. Balasubrahmanya Iyer made a report of the activities of the Institute for the period August, 1963 to July, 1964.

Dr. C. P. Ramaswami Iyer presided over the function.

Sri S. Ramayya, Retired Accountant-General delivered the Foundation Day Address and spoke on some rare coins in his collection. He stressed the importance of numismatical studies in the field of historical research and explained how the study of coins helped in corroborating or correcting inferences from literary and epigraphic sources. He added that coins shed light on the economic, linguistic and palaeographical conditions of an age. He selected three coins from his collections and gave detailed description of their peculiarities. A summary of this lecture will appear in another issue of this Journal. Sri K. Balasubramanya Iyer proposed a vote of thanks.

12—4—1965

MR. M. HARA

Mr. Minoru Hara, Lecturer in Sanskrit, University of Tokyo, who was on a brief tour of India as guest of the Govern-

ment of India under their cultural Exchange programme visited the Institute on 12th April, 1965.

A meeting was held in the Sastri Hall under the auspices of the Institute.

After Tea Dr. Raghavan introduced the guest and Mr. Hara spoke on Sanskrit studies in Japan and cultural contacts between Japan and India. He said that Indian studies, particularly Buddhism, were provided for in seven Universities and Sanskrit was taught at two, Universities of Tokyo and Kyoto. He referred to his own special study of Śaiva schools like Pāśupata. He answered some questions from the listeners. Thanking him Dr. Raghavan recalled his recent visit to Japan and urged the need for greater contacts with Japan and Japanese Indologists. Japanese Indologists, Dr. Raghavan said, were in considerable number and were engaged in important work on a variety of subjects including Sanskrit Grammar, Drama, Veda and Śrauta.

OBITUARY NOTICES

We are sorry to record the passing away of three of the Members of the Institute, Dr. C. S. Krishnaswami, Dr. R. Krishnamurthi and Prof. G. H. Bhatt.

Dr. C. S. Krishnaswami was a distinguished Civil Surgeon who after retirement was engaged in public work and gave liberally to educational and cultural causes. A lover of traditional culture he gave an endowment of Rs. 5,000 for lectures in the Sanskrit College, Madras on the ideals of plain living and high thinking as embodied in traditional Sanskrit literature.

Dr. R. Krishnamurthi was a Ayurvedic Physician and a student and supporter of Sanskrit studies. He had presented several Sanskrit books to the Institute's library.

Prof. G. H. Bhatt, who recently passed away in Baroda, was Professor of Sanskrit and later he took a lead in the starting of the project of the critical edition of the Rāmāyaṇa under the auspices of the M. S. University, Baroda. He was Editor of the project till his end. He received the Presidential award for distinguished scholars during the last year.

V. R.

BOOK-REVIEWS

The Tamil country under Vijayanagar. By Dr. A. Krishnaswamy. With a Foreword by Dr. C. P. Ramaswami Aiyar, Vice-Chancellor, Annamalai University. Annamalai University Historical Series No. 20, 1964, pp. VIII+418.

The history of the Vijayanagar empire in all its varied aspects, political achievements, administrative institutions and the impetus it gave to the religious and artistic revival in South India is a subject of absorbing interest. Since Robert Sewell wrote his 'A Forgotton Empire' in 1900 a plethora of fresh source material has become available for its study, thanks to the discovery of hundreds of inscriptions and a number of literary works in Sanskrit, Telugu, Kannada and Tamil providing useful historical data. A complete and up to date account of this last great Hindu empire of South India in all its aspects remains yet to be written. The present book under review makes an attempt at one such aspect--the role of Vijayanagar in the politics of Tamilnad.

This book forms the thesis by Dr. Krishnaswamy which was approved for the Ph. D. degree of the Annamalai University in 1959. It is more an endeavour to clarify and throw more light than before on certain problems connected with the history of Tamilnad under Vijayanagar than an account of the history of the area under its hegemony as the title of the book may lead one to think. Most of the problems discussed in the book have been examined earlier by many scholars who have done research in the history of Vijayanagar and the Nayakships under it. It must be said to the credit of the author that he has examined all of them afresh with thoroughness and clarity. When he differs at times from the views of earlier scholars he presents cogently the merits of his own case. The criticism of the views of T. K. Velu Pillai regarding the Vijayanagar campaigns in the Travancore is an instance in point (pp. 212-216).

Of the fifteen chapters into which the book is divided the first three deal with the early invasions and conquest of Tamilnad as far as Madura by Vijayanagar by 1371 A.D. The identification of Bakan of Shamsi' Siraj' Afif with Bukka I as

the probable first conqueror of Ma'bar is convincing (pp. 2-4). The next two chapters that deal with the rule of Kumara Kampana and his officers in Tamilnad are followed by a critical review of the working of local institutions in the Tamil country in the fourteenth and fifteenth centuries and an examination of the circumstances under which the ancient Sabhās, Ūrs and Nāḍus declined. Though this discussion is fairly exhaustive and well documented much of it appears to be an unnecessary insertion into a continuous narration of the political history of the period. The author has well portrayed the spectacle of raising provincial insubordination with telling consequence on the stability of the central government in the second half of the fifteenth century. The Banas who were originally feudatory rulers in the North Arcot and Chittore districts and moved farther down and were in occupation of the area round about Madura invaded Conjeevaram in 1469. Added to this was the invasion of the same city by the Gajapati ruler in 1463 A.D. On the authority of the wording of inscription from Iḍaiyāṟu, Arakaṇḍanallūr, Nerkunṟam and Jambai the author attempts to maintain that the Gajapati invasion was but a passing inroad thereby challenging the earlier views of Krishna Sastri and R. D. Banerji, namely that this invasion resulted in the actual occupation of Tamilnad right upto Trichinopoly (pp. 112-115). Nevertheless the frequent troubles from the neighbouring kingdoms and the rising banner of powerful feudatories were forces against which the once powerful government at the centre could not stand for long. All this is narrated in a vivid manner with the support of adequate documentary evidence.

The relations of Vijayanagar with Tiruvaḍirājya in the extreme south and the success of the former in her wars against the latter are dealt with in two chapters. The discussion of the political conditions that followed is mainly devoted to an account of the rise of Nayakships of Gingee, Madura and Tanjore and the role played by each of them in the historic battle of at Talikota and the later civil wars which ultimately resulted in the battle of Uttiramerur.

The book bears evidence of painstaking work by the author and the presentation shows 'a sense of balance and proportion'. The bibliography is exhaustive and index good. But one notices an indiscriminate usage of diacritical marks which are

misleading, as for instance Kampaṇā for Kampaṇa, Daṇṇāyaka for Daṇṇāyaka, Sōmappa for Śōmappa and Ōlaināyakham for Olaināyakam to mention only a few. The errata at the end which runs to two pages is selective rather than complete. A map of Tamilnad illustrating the main theme of the book could advantageously have been added.

T. V. MAHALINGAM

ESSAYS IN SANSKRIT CRITICISM. By Dr. K. Krishnamurthy. The Karnatak University, Dharwar. Rs. 5.

This is a collection of twenty-six essays on diverse topics of Sanskrit Poetics which the author had originally contributed to different journals at different times. The author says in his prefatory note that this attempt is to make the principles of Sanskrit literary theory as much of interest to the general reader as to the specialist. The literary concepts are traced from their origin ; and parallels are also drawn from Western writings. But it is to be noted that much of this information is second-hand. Many chapters also overlap in subject-matter, *e.g.* 'The Riddle of Rasa' and 'The concept of Suggestion in Sanskrit Poetics'. Chapter XIII, 'Sanskrit Conception of poet etc.', XVI 'Indian Definitions of Poetry' and also XVII 'The essence of Poetry' could all go under one head. Some chapters like 'The Golden Age of Sanskrit Drama' should have been omitted as they deal with very well-known dramas in Sanskrit. Nor do we find anything new in chapters like 'Message of Epics' and 'Some Thoughts on Sanskrit Literature'. 'The contribution of Karnataka to Sanskrit Literature' is out of place in this collection as its subject is not literary criticism. A Novel view of Mahimabhaṭṭa is nothing much novel.

There are many factual errors such as that the Alaṅkāracintāmaṇi is a singular contribution to the Alaṅkāraśāstra. The statement here that the author of the Gadyakarṇāmṛta is the son of the author of the Sañjīvanī on the Alaṅkārasarvasva is wrong; he is the grandfather.

The author has cited parallels from the writings of Western critics, but it is a pity that most of these passages are not supplied with reference.

Clarity is lacking in general. Sometimes even well-known facts are made knotty and confused. Translation of some of

the technical terms is not satisfactory. *E.g.* Sahṛdaya—intelligentsia (p. 213), Utprekṣā—hyperbole (p. 33). Diacritical marks or spelling are not strictly used. Many printing mistakes are not noted in errata. There is dislocation of pages in the Index.

D. C. Sarasvati

Bana. By Prof. R. D. Karmarkar. The Karnatak University, Dharwar. Rs. 3, $ 1 or shillings 7.

This book on Bāṇa represents the Extension Lectures delivered by Sri R. D. Karmarkar of Poona, in the Karnatak University at Dharwar.

Beginning with a discussion on the date of Bāṇa, the lectures deal with the poet's life and works, the types of composition called Ākhyāyikā and Kathā, the contents of Harṣacarita and Kādambarī, and give a critical appreciation of Bāṇa's style and scholarship. They also devote some attention to the state of society in Bāṇa's time. Five appendices are given which contain passages from the poet's two prose works to illustrate his style and scholarship, proverbial passages, verses in praise of Bāṇa, geographical references and an Index of important names and topics.

There are two short discussions of Bāṇa's references to the earlier poets and compositions in his introductory verses to Harṣacarita and on the sources for the plot of Kādambarī.

A brief analysis of the contents of the drama 'Pārvatīpariṇaya' is also given in the beginning chapter of this book. The author is out of date when he holds Bāṇa as the author of this play (p. 21) as scholars have clearly shown that it is not from the pen of the great Bāṇa.

On p. 4, Prof. Karmarkar takes "Dāmodara, a dārdurika" in the retinue of Bāṇa as a potter or frog doctor. The correct interpretation of dārdurika is one who plays the drum Dardura; he is thus one of the musicians in the poet's entourage. In some places the old readings in the Bombay Sanskrit and Prakrit Series are used: Vāsadhāra for Vāsabāṇa, Haraṇikā for Hariṇikā, etc. The account of Bhartsu is very meagre (p. 46). The fact that he was the preceptor of Bāṇa is not even mentioned.

C. S. Sundaram

DESCRIPTIVE CATALOGUE OF MANUSCRIPTS IN THE KANNADA RESEARCH INSTITUTE, DHARWAR, Vol. V. Kannada Research Institute, Karnatak University, Dharwar, 1964, pp. XVII, 147. Price Rs. 3.

The Kannada Research Institute, Dharwar, was started in 1939 and it has so far collected over 2,500 manuscripts out of which about 500 have come from the Madras Government Oriental Manuscripts Library. It has brought out four Volumes of Descriptive Catalogues, with details about 224 manuscripts in all.

The volume under review is the fifth, with descriptive details of 80 Kannada manuscripts. Each manuscript is described under 12 to 14 heads of information. Except the last, the Remarks, which is in English, the rest are given in Kannada. Details like find-spot and date of transcription are also added. The Catalogue consists of both Kannada and Sanskrit works. Though most of them deal with Jain and Vīraśaiva philosophy, other works are also seen here. There are some in Vyākaraṇa and Kośa written in Sanskrit with Kannada commentary.

The following works described in the Catalogue, namely 'Akkagaḷa Vachana', 'Akrūrānubhava', 'Akṣarapraśne' 'Akṣaramālikāgadya', 'Akṣarāṅkanagadya', 'Ajāmiḷana Caritre', 'Kārakarūpu', 'Gajendramokṣa', 'Jheṅkāra Nijaliṅgaprabhu Śataka', 'Pañcākṣarī Stotra', 'Majjana Nīḍuva Mantra', 'Vṛṣabhakavaca' and 'Śāradā Choupadana', are not noticed by R. Narasimhachar in his Karṇāṭaka Kavicarite. This point deserves to be noted.

Sanskrit works noticed in this volume are the following: Akalaṅka Stotra by Akalaṅka (with Kannada meaning); Akārādinighaṇṭu (with Kannada meanings); Akṣaramālikāgadya by Pālkurike Somanātha; Akṣarāṅkanagadya by Pālkurike Somanātha; Anāmayastotra by Daṇḍin; Aṣṭottaraśatanāmagadya by Pālkurike Somanātha; Ādibharata (with Kannada Commentary); Udāharaṇagadya by Pālkurike Somanātha, Kārakarūpu (with Kannada Commentary); Dhanañjayanighaṇṭu by Dhanañjaya (with Kannada Commentary); Namaskāragadya by Pālkurike Somanātha (with Kannada C.); Pañcaprakāradagadya by Pālkurike Somanāthā; Pañcākṣarīstotra (with Kannada Commentary); Majjana Nīḍuva Mantra;

Malayarājastotra by Malayarāja; Ratnakaraṇḍaka by Samantabhadrasvāmi (with Kannada C.); Vṛṣabhakavaca; Ṣaḍvaktra (with Kannada Commentary); Sajjanacittavallabha by Malliṣeṇa (with Kannada Commentary); Halāyudhastotra by Halāyudha.

A revision of the order in which the works appear seems to be called for as the order is wrong in many places, namely, No. 2; Nos. 3-11; No. 12; Nos. 13-15; No. 26; No. 58; Nos. 69-71.

N. R. SUBBANNA.

ONTOLOGY OF ADVAITA. By Dr. K. B. Ramakrishna Rao. Research and Publications, Vijaya College, Mulki.

In reply to the question often posed on Advaita: how can the Absolute Brahman which is infinite, partless, and the one reality become the unreal universe and the multiplicity of individual souls, the author of the present booklet gives a twofold answer: the first is that there can be only internal objectivation or internal polarity in the forms of six dimentional finitudes which claim no real status with the infinite (p. 5). 'The second answer' says the author 'takes a line of concession to our finite intelligence yet not contradicting the infinity of Brahman (p. 8). In this view on the evidence of our concrete experience 'empirical reality' for the universe is admitted.

Here we have to consider the two views of Advaitic tradition regarding Reality. One is called ekasattāvāda in which Brahman alone is real and the universe including the Jīvas is Prātibhāsika. The other view accepts three kinds of realities, the Pāramārthika, the Vyāvahārika and the Prātibhāsika. In both these views objectivation and multiplicity are inside Brahman and not external to it as that would contradict with Brahman's infinity and its being the substrate of the whole universe. Externality which is experienced is not in relation to Brahman but to the Jīva the experiencer who is conditioned. Besides this externality also is a super-imposition on objects which are really inside Brahman.

Thus the author's contention that in the second solution there are objects with empirical reality outside Brahman needs further enquiry.

The author's quotation of 'Now this ātmā is loka' (page 7) from Bṛhadāraṇyaka (1-4-6) in support of his state-

ment, 'The outer-world and the souls exist in the absolute' is not warranted by the context or by Śrī Śaṅkara's Bhāṣya thereon which reads: Ātmā the house-holder is the Loka, lean or the support of his dependents.

The etymological meaning of the word Māyā given by the author 'Mīyate anena (anayā) iti māyā (that which measures)' is not accurate since the word Māyā is derived from the root 'Maya jñāne' and not from 'māṅg māne'.

S. SUBRAHMANYA SASTRI

DACCA—THE MUGHAL CAPITAL. By Dr. Abdul Karim, the Asiatic Society of Pakistan, Dacca (Pakistan Rs. 20. Foreign, 40 Shillings or $ 7.50).

The book under review gives valuable information on the rise and fall of Dacca, the Mughal capital. The author, Dr. Abdul Karim, while working in the Commonwealth Relations Office between 1960-'62 as a Commonwealth scholar came across manuscripts "relating to the early part of the East India Company's administration in Bengal. Valuable though these documents were in preparing an economic history of Bengal, the author, as he writes in his preface, however, could not undertake such a work." Hence he confined himself to the collection and study of documents and statistical data relevant only to the district of Dacca. Though many other books have been written on Bengal and Dacca, the present book views the subject from an entirely new angle. The author vividly narrates the story of the rise and fall of the Mughal Capital, the part played by Dacca in the Mughal administrative system and analyses the economic factors responsible for the rise and fall of Dacca.

The book comprises of six chapters, thirteen appendices, a select Bibliography, index and five maps-running to 514 pages. The chapters describe in a simple and striking way the problems which beset Bengal in general and Dacca in particular. In the introduction the author discusses the origin of the name of Dacca and its early history, geographical features and the hydrography of the city. In the second chapter the history of Dacca under Nawabs and Nazims is narrated. In the same chapter the author discusses at some length the reasons for the transfer of the capital to Dacca, the position of Dacca during the 17th and 18th Centuries and an account of the Naib-

Nazims of Dacca. A complete list of Naib-Nazims of Dacca in chronological order is also furnished towards the end of the chapter. In the third, fourth, fifth and sixth chapters the author has dealt with in detail the growth of the city of Dacca, the forces contributing to the growth of the city, its golden period, its importance as an administrative headquarters and as a centre of trade and commerce. The appendices give us an account of the revenues of Dacca from various sources.

The book is well documented and the available material is carefully used and wherever necessary maps are given. The book makes a pleasant and useful reading and will be of interest both to the layman and the scholar and will be a welcome addition to the collection of books on Dacca.

S. A. R. Bokhari

Origin and Development of the Assamese Drama and the Stage. By Dr. H. Bhattacharyya, M.A., D.PHIL., 1964. Barua Agency, Dighali-Pukhuri-Par, Gauhati (Assam), India. Pp. xii and 252. Price: De Luxe Edition Rs. 17.00; Popular Edition Rs. 12.00.

The original patrons of the art of the theatre in India were the temples and the courts of the ruling princes of the various regional states. The troupes attached to these institutions were often free to give extra shows to the general public to supplement their land-grants and other emoluments.

This resulted in the gradual modification of the techniques of the classical Sanskrit Drama in practice. Various irregular forms began to be composed. The 'Prabandhams' of the Deccanese area, the 'Cchāyā-Nāṭyas' of Central India and the 'Kūḍiyāṭṭams' of Kerala were the product of these practices. The popularity, during this epoch, of the Bhāṇa, the monologue, can also be attributed to the same phenomenon.

The flowering into maturity of the regional languages out of the various Prākrit Dialects, retarded the further expansion of the highly-developed Sanskrit Drama. When plays began to be performed more and more before the common people, the actor-manager or his assistant had to transform himself into a vidūṣaka to interpret the verses and other Sanskrit passages to them through a variety of theatrical devices. Old plays had to be re-written and new plays composed in local Maṇi-pravāḷa diction. When, again,

these vernaculars began to assert their literary individuality still further, whole plays too had to be composed in them in *the then prevalent* irregular techniques, ignoring the rules of the 'Nāṭya-śāstra'. The 'Āṭṭakkathas' of Kerala, the 'Yakṣagānas' of Karṇāṭaka, the 'Bhāgavata-meḷa-nāṭakas' of Tanjore, 'Kuchipuḍi' of Āndhra, the 'Yātrās' of Bengal and the 'Aṅkiya-nāṭs' of Assam were a few of the many types of such dramatic creations.

When, at a still later epoch, India renewed its cultural contacts with Europe, Western theatrical techniques too influenced the vernacular stage, and we have now, in modern India, a Theatre and Drama, which mixes up the forms and techniques of the East and the West.

The above is the general Historiographical pattern of the growth of regional Indian Dramas, which Dr. H. Bhattacharyya, the author of the above otherwise documented history of the Assamese theatre, has missed to develop in his Thesis. Although it is axiomatic that the dramatic literature of a regional language can only follow its advent, the Stage of that region can have a prior existence. And the Stage of Assam did exist anterior to its language, as is evidenced by literary references to the staging of the 'Hanūman-Nāṭaka' and the 'Prabodhachandrodaya' in Sanskrit in the pre-Śaṅkaradeva epoch. Even the 'Ōja-Pāli', which is supposed to be indigenous to Assam, must have had a prior history of its own, because of its very close resemblance to the Thespian form of the Attic Chorus, not to speak of its sister-types elsewhere in India.

Dr. Bhattcharyya's Doctoral dissertation is, nevertheless, a mine of information to the student of international drama. It reveals the existence of a wealth of source-material in Assam.

The second point that strikes as unique to Assam is the existence of a number of local socio-religious institutions, called satras, which may be said to be the Assamese counterparts of the temples and mutts of the other provinces of India.

The third peculiarity of the mediaeval Assamese Stage is that most of the earlier playwrights and performers were non-professional. Śaṅkaradeva and Mādhavadeva were saints. Except the Brahmin artistes of the 'Bhāgavata-Meḷa-Nāṭaka,' the royal sponsors of Kathakaḷi, and the devout followers of Chaitanya in Eastern India, there seems to be no other of the kind elsewhere in the sub-continent.

In other respects, the developments in Assam have their counterparts in the other regions in India. The 'Aṅkiya-Nāṭs' may be likened to the 'Āṭṭakkathas' of Keraḷa, while 'the term 'Bhāwana' is but a Sanskrit equivalent of the Malayāḷam 'Kathakaḷi' (Katha=Story, Kaḷi=representation). The 'Ōja-Pāli' has its counterpart in the 'Ōṭṭan Thuḷḷal' and other Thuḷḷals of Kerala.

The author has traced in his book the development of Assamese drama from the 'Aṅkiya-nāṭs' of Śaṅkaradeva, through subsequent mythological and melodramatic plays, curtain-riser farces, satires and allegorical dramas, to the modern historical and social tragedies and comedies of the twentieth century, modelled on Shakespeare, Ibsen and Shaw. He has, in the same manner, traced the evolution of theatre-craft and lighting from their primitive stage to the modern electricity epoch. He has, besides, commendably avoided, for obvious reasons, comparisons of the quality of Assamese dramas with those of the other Indian languages. The book has a valuable glossary of Assamese theatrical terms, a bibliography and an Index.

One earnestly wishes that there were similar books in English on the other linguistic theatres of India, because every development traced here reminds a non-Assamese reader of parallels in his own region.

The publishers deserve special mention. Barring a very few insignificant typographical errors, the printing and get-up are satisfactory.

V. RAMASUBRAHMANIAM 'AUNDY'

THE JAGADGURU. Edited by Dr. V. Raghavan. Published by "Jaya-Chandra" 15, IIIrd Trust Cross Street, Madras-28. Rs. 2-50. Ordinary, 3-50. Half Calico.

It is indeed thoughtful and timely of 'Jaya-Chandra' publishers to have collected the recorded interviews of some of the visitors from abroad with the Acharyaswami of Kanchi Kamakoti Peetham, Sri Chandrasekharendra Sarasvati. The publiction was released by His Holiness Sri Jayendra Sarasvati, to mark the occasion of the completion of seventy-two years of the sage of Kanchi.

Nearly nineteen of such interviews and accounts of them with foreigners have found a place here with a significant

Preface from the pen of Dr. V. Raghavan, whose association with this publication can vouch for both its authenticity and accuracy in the editing.

The two chapters, one at the beginning and the other almost towards the end from Paul Brunton, have been taken from his now widely-read book 'A Search in Secret India.' The rest are based on recorded copies and a few from the Press and Journals. Some of the visitors had themselves written out impressions of their talks with His Holiness and the considerable benefit, spiritually, which they derived from their talks with His Holiness. The visitors are from all the parts of the world and the interviews range over many years. They have come from countries like United States, South America, England, France, Belgium, Switzerland, U.S.S.R., and Japan. Apart from the interesting nature of the questions asked of His Holiness, there is an evident earnestness on the part of the questioners to understand Hindu religion, and also the need of the hour, to save the world which is passing through a crisis.

Some of these talks reveal the extent to which the other parts of the world, or the so-called advanced countries, are really in search of a panacea for the many ills they are heir to, in the wake of the fierce competitive race for increasing nuclear power and the consequential bid for control of others. There is something elusively graceful and well-poised in the answers of His Holiness which cannot fail to convince everyone, reading these pages, of the utter love he bears towards all, as well as the desire he cherishes that the entire humanity should try to become pledged to peaceful co-existence.

K. CHANDRASEKHARAN

THE MAHIMNAS-STAVA. Edited, translated and presented in illustrations by Prof. W. Norman Brown, Professor of Sanskrit, University of Pennsylvania, American Institute of Indian Studies, Publication No. 1, Poona, 1965. Rs. 5.

The Śivamahimnas-stava is a well-known old Śiva hymn quoted by standard writers and recited by countless devotees of Śiva. One of the few standard hymns which has received the attention of several commentators, the Mahimnas-stava is earlier than the 9th century A.D. when the earliest reference

to it is seen in literature. The hymn has also been preserved in a stone inscription of the 11th or 12th century A.D. Of this important work in Sanskrit Stotra literature, we have here an attractive edition with illustrations brought out by Prof. Norman Brown from whom we had some time back a similar edition of the equally important Stotra, Śaṅkara's Soundaryalaharī.

The illustrated manuscript which is the basis of this edition is preserved in the Baroda Museum and the paintings form, according to Prof. Brown, an example of the transitional period, early 17th century, when the earlier Western Indian style evolved into the Rajasthani. In the Introduction, the editor has also dealt with the date of the hymn and given a gist of the main ideas embodied in the hymn. In the main part of the publication, the Sanskrit text and the English version are given face to face. In the end are furnished an account of the manuscript material, critical apparatus, a list of additional stanzas, index of verses and an *index verborum*. The latter part of the Volume carries the plates of the illustrative paintings with notes on each drawing. Prof. Brown is to be congratulated on the production.

The volume is appropriately issued as the inaugural Publication of the newly established American Institute of Indian Studies. May Lord Śiva, the embodiment and source of all knowledge, bless the Institute in its work in the field of Indian culture and in promoting fruitful co-operation between American and Indian scholarship.

V. RAGHAVAN

LETTERATURA CLASSICA DELL'INDIA ANTICA. By OSCAR BOTTO. Editrice Studium, Rome, 1964. Text pp. 1-178; bibliography; index of authors and works.

In less than two hundred pages this little paperback of popular appeal presents the essential facts of Sanskrit classical literature to the general reading public of Italy, or to anyone, for that matter, who has a reading knowledge of Italian. The Italian student of Indian studies will find that this is indeed a handy guide to the most important works of later Sanskrit literature with which he will wish to become acquainted, even in a superficial way. Although the approach is historical, the Sanskrit classics are not dealt with chronologically but by literary genres. Beginning with Sanskrit drama (pages 7 to 68) and ending with the narrative literature in prose and

poetry (141 to 178), the main currents of the development of *belles-lettres* are traced briefly and yet with interesting details which encourage the reader to delve more deeply into the subject. The bibliography, which is primarily a list of the works which the author himself has utilized in compiling his outline, is not as helpful as it could be. What the reader will seek is a list of translations into Italian of the many delightful works to which he has been introduced. What he finds is reference to three books, one of which (Vallauri's translation of the *Satyahariścandra*) is virtually inaccessible at the present time. More readily available are Vallauri's excellent drama anthology, *Teatro indiano* (Milan, 1959), and Pisani's *Le piu belle pagine della letteratura dell'India* (Milan, 1962). It is unfortunate that Professor Botto did not include a list of the Italian translations of Sanskrit classics (comprising several of his own) in order to show how many of these works are within reach of the reader who is not able to have recourse to the originals.

What distinguishes Professor Botto's survey from the previously published accounts of classical Sanskrit works is the inclusion of the latest research on specific texts. His discussion of Nārāyaṇa's *Hitopadeśa* is supported by the conclusions which were reached by Sternbach (*The Hitopadeśa and its sources*, New Haven, 1960) with regard to the make-up of this important reworking of the *Pañcatantra*. The details which he is able to give about Somadeva Sūri's *Yaśastilaka* are the results of his own research on the author and his works. His special interest in Kṣemendra is obvious. The account of this author and his important contributions to Sanskrit literature are more elaborate than one would expect in this type of brief survey.

The Italian student of Indology cannot help but welcome this little work as a fitting sequel to Pisani's *Storia delle letterature antiche dell'India* (Milan, 1959), which is mainly concerned with the earlier period.

GEORGE T. ARTOLA

IL NITIVAKYAMRTA DI SOMADEVA SURI. By Oscar Botto. Pp. 230. Universita di Torino. Facolte di Lettere e Filesofia. Torino, 1962.

Although only two works of Somadeva Sūri, the *Digambara Jaina* who lived in the tenth century A.D., in Lembulapāṭaka Hyderabad State), have survived, they are all we need to

prove conclusively that he possessed an encyclopedic knowledge of many fields of intellectual activity. The *Yaśastilaka* in spite of much interest it has aroused, still awaits translation into a European language. The *Nītivākyāmṛta* has been more fortunate, for it has been ably translated and interpreted in this excellent study of Professor Botto. The introduction is well documented and full of interesting information about the author and his work. The foot-notes which accompany the translation are extremely helpful in enabling us to determine the connection of the *Nītivākyāmṛta* with other similar *rājanītiśāstras*, especially with the great *Arthaśāstra* of Kauṭilya. It is immediately obvious that Somadeva Sūri was well acquainted with the principal authorities in the field of early Indian political theory and practice and that for his anthology of political and legal maxims, since this is what the *Nītivākyāmṛta* really is, he was able to draw upon the works of some authors, *viz.*, Parīkṣit, Bharadvāja *et al.*, which have not come down to us. When the *nibandhas* of these authors are discovered, if they are discoverable, the *Nītivākyāmṛta* will be exceptionally valuable for comparative purposes; Professor Botto's translation will then prove to be very useful.

The challenge of rendering into Italian the terse quasi-*sūtras* of Somadeva Sūri has been successfully met by Professor Botto, even though it may not be possible to agree with his translation of several difficult technical terms. He questions, with reason, his own translation of *jāyāvara* (V. 21; text p. 45) as "capi di famiglia," when the term is more correctly *yāyāvara* and refers to one of the four classes of householders, more specially, the itinerant householder, cf. Raghavan's edition of the *Śṛṅgāramañjarī*, p. 24: "*Yāyāvara*, according to Devala's *Smṛti*, is an itinerant variety of the householder, *gṛhastha*, as opposed to the *Śālīna* who had settled down in a fixed abode."

For the sake of consistency *tantra* is unhappily translated as "forze armate" (armed forces) or "esercito" (army) wherever the term occurs. The word, unfortunately has always been troublesome, even in rendering the title of the well-known fable-book. The original meaning of *tantra* "weaver's thread" has been extended in the *Pañcatantra* to the five principles of *nīti* which the work proposes to teach; cf. *Wiener Zeitschrift für die Kunde des Morgenlandes*, LII (1955), 380-385. On the basis of this the term *rājatantra*

was composed to indicate "administration of a kingdom, royal polity." It is this particular sense that *tantra* has in the passages referred to in foot-note 4 of page 62. Thus, for example, in XXIX, 77, *tantramudvāsayati* would be better translated as "puō confondere l'amministrazione statale". The entire passage would than read: "Come un colombo che entri in una dimora mette in disordine tutta la casa, la gente che ē legata in alleanza con el nemice, per quanto insignificante sia, puē confondere l'amministrazione statale."

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AN ANTHOLOGY OF SANSKRIT COURT POETRY. TRANSLATED by Prof. Daniel H. H. Ingalls, Harvard Oriental Series 44, 1965. $15. Rs. 75.

In Volume 26 (pp. 199-20) of this Journal, the Sanskrit original of the present publication was reviewed. In 1957, the *HOS.* issued as its forty-second publication the Sanskrit text of the *Subhāṣitaratnakośa*, an anthology by Vidyākara, compiled in the 12th century A.D. under the Pālas of Bengal. Apart from being the first of this class of works whose date could be definitely ascertained, this Anthology brought together much beautiful poetry, some by little-known authors. The General Editor of the *HOS.* was therefore of the view that an English translation of this could go well with the poetry-loving English reading public. He accordingly prepared a verse-translation and here we have as No. 44 of the *HOS.* his English version, to which he has added an illuminating Introduction, several critical notes and appendices all of which add to the value of the work.

In his Preface and Introduction Prof. Ingalls rightly stresses the value and beauty of Sanskrit poetry, which has received so far very unsympathetic or apathetic treatment at the hands of the well-known historians of Sanskrit literature. To help the English reader, who may be unfamiliar with the norms and modes of the poetic art in Sanskrit, the author has explained the special features of Sanskrit poetry and the doctrines of Sanskrit Poetics, Rasa, Dhvani etc., as also the employment of Alaṅkāra, particularly Śleṣa.

In the text-part, each subject-section is prefaced by a short article which elucidates the conception of that subject in Sanskrit literature, *e.g.* Seasons, Love, Nīti, Anyāpadeśa.

In the end are appendices in which emendations in the text adopted by the translator, indices of topics discussed, and metrical analysis are given. An important part of the last portion is the Notes in which not only additional textual points are dealt with, but verses with *Śleṣa* which could not be rendered straight into the English verse-form, are explained in detail.

The Introduction affords refreshing reading and judgments about aspects of Sanskrit poetry and poetics to some of which attention may be drawn, as generally, the normal type of history of Sanskrit literature by the orientalist avoids this kind of purely literary approach. P. 5, regarding *Kumārasambhava* 8.26, Ingalls says. "Here a harmony of visual imagery accompanies the harmony of metrical form," and compares the pen picture here to a painting. Regarding *Sanskrit prosody* and the aids at its command, he says (p. 9): "In view of these aids I have never been dazzled by Sanskrit metrical ingenuity although I admit that I find it delightful." On *Alaṅkāras*, on the same page, we read "In the analysis of poetic figures of speech (*alaṅkāra*), the Sanskrit critics surpass the Greeks and Romans. They surpass them not only in subtlety, but also, as it seems to me, in understanding, for the Sanskrit analysis is based directly on poetry whereas the Greco-Roman analysis was based in the first instance on oratory..........." On *Dhvani*, p. 21:" In the hands of a true poet, Sanskrit suggestion can achieve effects of tremendous power." Regarding *poetic conventions*, which a critic is prone to consider as a source of monotony, our author observes (p.27): "But the Sanskrit conventions give constantly new and fresh effects." Of *Suggestion* again, the following on p. 29 is remarkable: "If I were to single out for admiration one factor above the others, .. it would be suggestion......because the Sanskrit poets use it with such brilliance......". Two further examples can be given to show the translator's insight into the beauties of Sanskrit poetry; one, his appreciation of the enthralling opening of Kālidāsa's Kumārasambhava and another, regarding the appeal of the mood of Māna in love (p. 216). The former occurs in p. 34, regarding the opening verses of Kālidāsa's K. S. Each verse furnishes a separate and complete thought, employs distinct images.....And yet there is a cumulative flow to these verses, in effect not

unlike the opening of a symphony. Ice and snow, the scintillation of the close sun-light, the peacock feathers of the mountaineers, the jewelry of the nymphs, the incarnadined masses of clouds-these images and hues burgeon into a vision each part of which, while remaining distinct, reinforces the rest. . . . ."

The Introduction discusses also questions like the absence of tragedy in Sanskrit, the impersonality of Sanskrit verse or even of Sanskrit literature, the nature of the text of a Sanskrit play (pp. 38, 39) etc., which could be considered only on another occasion.

Some minor points could be noted:

The author-name Malayarāja, adopted regularly without any remark, is a mistake for Māyurāja or Mātrārāja; a third variant for this name is not known. Utpalarāja (p. 43) teacher of Abhinavagupta may be read as Utpaladeva; Utpalarāja is another name of king Muñja of Malva. The speculations here about Dharmakīrti as a writer on poetics and the Śauddhodani, mentioned by Keśavamiśra in his Alaṅkāraśekhara, as probably Dharmakīrti are not in the realm of likelihood. Mahodadhi (p. 45) may not be the title of a work like Śabdārṇava; it may refer to the writer, a Mīmāṁsaka, mentioned in the Prabodhacandrodaya, II. 3. On p. 110, para 3, the Mango must be included. Pp. 297-8, on the historical study of Anyāpadeśa, reference may also be added here to the present reviewer's paper on the Bhallaṭaśataka in the Annals of the SVO. Institute, Tirupati, I. i. p. 363; the statement here that there exists no collection of Sanskrit proverbs as such must be qualified; the Lokoktimuktāvali of Dakṣiṇāmūrti in K. M. Gucchaka XI contains a collection of them; P. 377, v. 1407, author-name Saṁgrāmāṅgaṇa is a sobriquet. P. 268, v. 883, Malayavāta is also apparently a sobriquet. Pp. 402-4, the character Rāvaṇa in drama is not substantially different from that in the epic, but for purposes of drama, poets Bhavabhūti and others harnessed the milieu of the Artha Śāstra for presenting Rāma and Rāvaṇa as rivals with their respcetive systems and schemes of allies, spies, etc. P. 414, v. 1577, the Mountain described is just Krauñca, not Krauñcāvān or Krauñcāvata; the correct reading in this verse from Uttararāmacarita is *Krauñcābhidho'yam giriḥ.* P. 472, v. 52, the phrase Karaṇāṅgahāra-

valanaiḥ in the description of Śiva's evening dance is correct and there is no corruption here; Karaṇa, of 108 kinds, is the movement and position of hands and feet and Aṅgahāras are sequences built of these (NŚ. ch. IV). P. 512, 625, v. Anargharāghava: There is no Dravidian Temple of Love here; there is a description of the city of Kāñcī, the crest-jewel of Tamil country and a place where love reigns supreme. P. 515, v. 668, Kandarpa-kandalī, literally would be 'Love's sprout or shoot; kandala is also 'navāṅkura'.

The printing and production are in keeping with *HOS.* tradition.

V. RAGHAVAN

PRESUPPOSITIONS OF INDIA'S PHILOSOPHIES. By K. H. Potter, Prentice-Hall Inc., Englewood Cliff, N. J., 1963, pp. xi, 276.

This is a very useful and interesting book since it adopts a point of view which, though illuminating, has rarely been adopted in the study of Indian philosophy. Most works on Indian philosophy are written either by Sanskritists, who are prone to ignore philosophical problems and issues, or by adherents of one of the philosophical systems discussed, who are prone to adopt a somewhat biassed perspective and may also lack sufficient textual knowledge and its critical evaluation. In both these approaches the Indian context of Indian philosophy tends to be stressed. Among the exceptions mention may be made of some authors of large surveys and compilations, such as S. N. Dasgupta. The present work adopts a philosopher's point of view, which is admittedly Western; and herein lies its strength and unavoidably, it appears, its weakness.

The main theme of this philosophical analysis is the interpretation of *all* systems of Indian philosophy in terms of freedom. With regard to this concept the distinction between "freedom to" and "freedom from" is introduced. This distinction, which may not be relevant to Indian philsophy, is analysed with great conceptual clarity. Indian speculative philosophy is then described as developing from various doubts with regard to the possibility of such freedom; thus its development is situated between the two extremes of the Cārvāka and the Ājīvika positions, which are sceptical about freedom and deny freedom, respectively.

The author admits that he cannot adduce any direct textual support in favour of this interpretation of Indian philosophy in terms of "doubts". It might be added that Indian doubts are more likely to arise with regard to the question *how* freedom can be obtained, than with regard to the question *whether* it can be attained. Actually this approach appears to be inspired by presuppositions on the role of doubt in philosophy, which are commonly adopted in the West since Descartes. But even where this is so, it does not follow that no new light could be thrown on the subject by adopting this perspective. In fact not the adoption of such a view, but the author's attempted justification for it seems at points questionable. For example, as an important argument the fact is adduced that many Indian philosophers begin their work "by pointing out the elements of causal chains culminating in release from bondage" (p. vii). However the fact that philosophical speculation in India is often linked to existing beliefs which advocate a path to freedom is easily explicable from a point of view the author never adopts, and which is nevertheless basic to any modern study of the background and presuppositions of Indian thought; in contemporary term, this viewpoint can only be described as sociological. When applied to the present problem, it is readily discovered that Indian philosophers, whatever they are speculating about, belong and care to belong to a living tradition, *e.g.*, Hindu, Jain or Buddhist; this is bound to find expression somewhere in their work. If they explicitly teach a philosophy of freedom, on the other hand, there is no problem. And so in either case, "release from bondage" is mentioned. From this point on, the author's point of view may lead to a prejudiced treatment of the subject matter: for the views which Indian philosophers actually propound need *not* depend on the sometimes formal declaration of allegiance given at the beginning of their work. There are numerous examples for such allegiance, superimposed from outside: the gradual incorporation of theistic elements in many systems is a case in point.

Despite this general outlook, which is undoubtedly overdone, this book contains a wealth of interesting material. Those who are accustomed to traditional or historical subdivisions of Indian philosophy will be for sometime at a

loss to find their way in a classification which juxtaposes what is generally separated and puts far apart what is generally treated together. However this is a positive feature. Even though this new classification may not be definitive (and the present reviewer, for one, doubts this in several respects), Indian thought needs to be studied in a new perspective so that some of its original freshness, long lost in traditional treatments, may become manifest. To have reached this aim in several respects is no mean achievement and the author may be congratulated to have sueceeded in this task.

Apart from detailed criticism, which limitations of space do not permit, it is somewhat surprising to note that this modern introduction to the study of Indian philosophy pays little attention to problems of Language and Semantics and to the considerable contributions, both logical and methodological, made by the Indian grammarians. While the preoccupation with freedom appears to belong rather to the realm of ethics, it is in the domain of language that Indian thought, in the opinion of the present reviewer, has made its most substantial contributions to philosophy. The reasons for the omission of these features from the present publication may well be that such features are hardly understood as dependent on presuppositions, but constitute instead positive achievements which should be studied for their own sake.

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THE TEACHING OF SANSKRIT by Prof. K. Rama Varma Raja, M.A., M. Ed. Published by Sri. T. V. Viswanatha Aiyar, Secretary, The Sanskrit Education Society, Madras, 14, East Mada Street, Mylapore-4. pp i-xiii, 1-133. Price Rs. 5·00.

The Sanskrit Education Society, Madras is to be congratulated on bringing out a scholarly and informative brochure on the 'Teaching of Sanskrit' as part of its scheme for resuscitating the study of Sanskrit, a task on which the heart of His Holiness Śaṅkarācārya of Kānchi Kāmakoṭi Pīṭha and lovers of Indian culture is ever set. The book under review is a valuable addition to the series of publications sponsored by the Society and is almost a pioneering work in the field of Sanskrit pedagogy.

When the interest in the study of Sanskrit is waning in the set up of the scientific age, when Humanities are at a discount, one has at least to make their study interesting and profitable for the few who are daring. It is the singular good fortune of the Society to have been able to persuade Prof. K. Rama Varma Raja to write the book 'The Teaching of Sanskrit.' The author combines in himself a deep knowledge of Sanskrit (Vyutpatti) with training in modern teaching methods (Abhyāsa). That the author was thoroughly equipped for the task is evident from the facts set out clearly by Dr. V. Raghavan on p. vi of the Preface. It is particularly pleasing for the reviewer to note that he is one among the few distinguished and talented band of old students of the Honours department of Sanskrit of the Presidency College. That the book is from the pen of a teacher who has served the cause of Sanskrit in High Schools and Training Colleges for over three decades adds to the value of the work. In fact as Dr. C. P. Ramaswami Aiyar has remarked in his admirable Foreword, 'Professor K. Rama Varma Raja, the author of this valuable brochure, has combined with his hereditary love for and study of Sanskrit, a knowledge of Comparative Philology and the pedagogic practice in many countries besides our own.'

That Sanskrit was a potent factor in the integration of the country for centuries cannot be gainsaid. Yet the modern trends with an accent on science and technology to the neglect of humanities and languages portend a future when mankind may be swept off its feet and wallow in the welter of materialism. Hence any effort in the direction of popularising Sanskrit studies which help in the full flowering of the human personality should be welcomed.

In the altered circumstances of to-day when Sanskrit can no longer be learnt or taught in the same old traditional way on a large scale, our thoughts are naturally directed to the best possible manner in which the new methods devised by modern psychologists and linguists can be grafted with profit to the old so that real interest can be created in the minds of those who seek to study Sanskrit. That the contribution of Indians from the ancient Vedic era onwards in the direction of language study is of no mean order has been admitted unreservedly by Western savants, but it does

not mean that the modern age has nothing further to offer in this field. As Dr. V. Raghavan has so ably put it in his Preface, 'The coming together of the peoples of the world and the need to learn foreign languages, as well as languages of culture, have led to investigations and experiments in the techniques of teaching languages and the teaching of Sanskrit alone could not stand aloof from all this ferment of thought in the field of language teaching.'

A careful perusal of the book would show how modern methods can be judiciously employed even in the matter of teaching Sanskrit language at different levels utilising at the same time the salient features of the old method of study and teaching. It may be truly said that every page of the book bears the stamp of one who has devoted considerable thought to the varied problems which beset teachers of Sanskrit. We come across at every turn authoritative and analytical expositions from the truly scientific standpoint of a pedagogue. The author has traversed the whole field of the art of teaching Sanskrit keeping always in the background the general principles of language teaching. He seeks to interpret the accepted theories of great writers in the field like H. E. Palmer, W.M. Ryburn and Govon and correlate them with the teaching of Sanskrit in a manner which we hope will be beneficial to the teaching of Sanskrit in our schools.

A very necessary background is provided by the author in the opening chapter where he deals with the clarification of languages morphologically and genealogically, the place of Sanskrit in the Indo-European family and the early linguistic speculations of the Hindus. The aims of the study of literature outlined by Mammaṭa are compared with more or less similar aims held during the period of Renaissance in Europe. The author also adverts quite pertinently to the linguistic, literary and practical value of the study of Sanskrit.

He has given valuable suggestions which the Educationists would do well to ponder over. In different States of our country we find different patterns of teaching Sanskrit at different levels and different age groups. Everybody would agree that Education in the classical language should follow a preliminary grounding in one's mother tongue. The author rightly cautions—'Care must be

taken to see that the introduction of Sanskrit is not postponed beyond this linguistie period between the ages of seven and twelve.' He is not halting in his criticism of the traditional study which lays undue emphasis on learning by rote and does not fail to point out how in several cases the subjects taught are beyond the capacities of the ordinary child. At the same time he commends several of the good features of the old method. There is no doctrinaire approach to the problem anywhere in the course of his exposition. He himself makes it clear that 'in the teaching of languages, the right system would be to adopt none exclusively and to neglect none absolutely. Each has its own uses.'

The advantages and limitations of the Direct mothod, the traditional method, the translation method and the substitution method have all been dealt with here with clarity and precision. Phonetics presents not much difficulty so far as Sanskrit is concerned since we have an exact symbol for every sound unlike the English language which bristles with vagaries of all kinds. The Paspaśāhnika of Mahābhāṣya would bear ample testimony to the importance attached to this aspect of language study and the author therefore warns against any complacency in this regard in modern times. Details about the methods of reading, types of composition etc. receive adequate treatment. The author pleads that 'Composition should begin with the powers of speech and should be oral before it is written,' and that 'Essay writing, epitomising and such other written work should have a place in the Sanskrit syllabus as they are followed in the case of other languages like English and the mother tongue.' Translation as one of the modes of semanticising is dealt with in a separate chapter with many useful hints for the teacher. Pointing out how handwriting in ancient days was marked by superfluous flourishes and strokes, he lays stress on the two essentials of good handwriting *viz.* legibility and speed. The odium attached to imposition as a sort of punishment would vanish if the following observation of the author is borne in mind— 'Reproduction of the same word or passage is likely to fix the correct spelling more firmly not only through the eye but also through the hand every time it is written out'.

The chapter on the teaching of prose, poetry etc. is dealt with in the orthodox fashion of a trained teacher giving ample details about the teaching procedure like preparation,

presentation, teaching of words and phrases, grammar, detailed study, non-detailed study, recitation etc. A pertinent observation on the study of grammar is made in the following lines—'A language is not learned by first learning its grammatical rules but by acquiring a linguistic sense in it through practice. A language is learned by talking it and not by talking about it, by reading it and not by reading about it.'

To those who have a craving for simplified grammar, the following recipe is offered: 'By a wise selection of roots of practical use from the 'dhātupāṭha' and by eliminating many words from the gaṇapāṭha, grammar can be rendered simpler to meet the requirements of classical literature.' The school of thought that adopts 'tiṅanta-prādhānya' finds favour quite justifiably at the hands of the author. 'Since ideas centre round the verbs, around which substances are built up, in the teaching of grammar it is reasonable to begin with verbs.........then proceed to nouns etc.' He makes a bold plea for introducing non-detailed texts in Sanskrit which may even be in the form of 'pārāyaṇa' of Rāmāyaṇa, Bhāgavata etc. In regard to choice of text-books and selections he does not find any reason why recent and contemporary writers should be excluded. Useful hints in regard to the introduction of modern types of tests which are intended to test the varied capacities of a pupil and not merely the capacity to recollect and reproduce certain facts, deserve careful study and implementation. In the chapter dealing with the Sanskrit teacher we are aptly reminded of the famous verse of Kālidāsa, 'Ślisiṭā kriyā.........'. That in the choice of a teacher the criterion of judgment should be not mere academic attainment but the skill to impart what he has learnt to others is indeed unexceptionable.

Here is a book which deserves the earnest attention, deep study and what is more important, faithful follow up by everyone connected with Sanskrit education at various levels.

P. Thirugnanasambandhan

Abhinavagupta An Historical and Philosophical Study. By Dr. K. C. Pandey. The Chowkhamba Sanskrit Series Office, Varanasi 1. Rs. 40/-.

Thirty years ago, Dr. Kanti Chandra Pandey published his Thesis on Abhinavagupta. The present publication is a

revised and amplified edition of that work, with four new chapters. The account of the life, works and historical background of Abhinavagupta have also been added to now. The *Paryantapañcāśikā* is one of the smaller works of Abhinavagupta which the present reviewer brought to light and published with notes in 1951; of this text, a fuller exposition has been included here by Dr. Pandey. Kashmirian thought, although generally identified as Kashmirian Saivism, is really a complex of Pratyabhijñā, Krama and Kaula schools; and therefore Dr. Pandey has given in chapters VI and VII separate expositions of the Krama and Kaula schools. All these strands attained a sort of synthesis in the hands of Abhinavagupta. For long, Dr. Pandey has been working on Abhinavagupta and his present enlarged exposition of that great philosopher is to be welcomed.

In dealing with Abhinavagupta as a philosopher, one cannot of course omit the aesthetics with which Abhinavagupta is associated. While therefore a treatment of the larger aspects of Abhinavagupta's theory of Rasa is legimate, it appears to be too much of a mix-up to give in this book very detailed bibliographical study of Alankara works and poems. The whole chapter on *Ghaṭakarpara* here would be missed by a student of general literature. Even so is the long space devoted to earlier writers on drama and writers quoted in the *Abhinavabhāratī*, nearly 75 pages (178-251). This includes not merely theorists, who may probably be brought in here, but also poets aud playwrights quoted by Abhinavagupta.

P. 238: Māyurāja and Anangaharṣa Mātṛrāja, dealt with as two writers, are really one and the same. On p. 249, the author has a section entitled 'Was Vikaṭanitambā an authoress?' It is true that scholars have taken her as a poetess, but no evidence has been cited against this; on the other hand, to show that she was only a character in a *prahasana*, Dr. Pandey, and one other scholar who spoke to me the reviewer privately, have caught hold of what they imagine is a quotation in the *Abhinavabhāratī*, in illustration of the *Lakṣaṇa* called *Manoratha*, Vol. II. GOS. edn. p. 362. Surely, Dr. Pandey should have read his *Abhinavabhāratī* better; for it is not Abhinavagupta who quotes this so-called *prahasana*, but the late M. R. Kavi, the editor. Pp. 348-364 are called Ṣoḍaśādhyāy *ānubhandha*, what *Kavi added* for the

sake of the Anuṣṭubh Recension of the *Lakṣaṇas*; and Kavi had made this clear in the headings and colophons on the above pages. Even on a well-known Kashmirian Śaiva philosopher like Utpaladeva, the grand-preceptor of Abhinavagupta, the author gives here wrong information when he says on p. 162 that Utpaladeva was both son and pupil of Somānanda. Utpala was son of Udayākara as he expressly says at tne end of his work Pratyabhijñākārikā-vṛtti: उदयाकरसूनुना । ईश्वरप्रत्यभिज्ञेयमुत्पलेनोपपादिता ॥ and as the colophons also to his other works say.

On pp. 107.125, there is a laboured thesis on the *Ghaṭakarparakulaka*, on which Abhinavagupta has commented, as a musical poem intended for the Stage; all this is absolutely baseless and Abhinavagupta who knew music, dance and the Stage, hardly says anything like this in his commentary on this poem.

These criticisms do not detract from the value of Dr. Pandey's work which lies in its philosophical chapters.

V. RAGHAVAN

RELIGION AND MAN. By His Highness Sri Jaya Chamaraja Wadiyar. Orient Longmans. Rs. 3.

This book represents the Ranade Lectures delivered by His Highness at the Karnatak University, Dharwar which had founded these Lectures in the name of the well-known Prof. Ranade, author of several volumes on mysticism and the pathway to God according to the different medieval saints. It is appropriate that these Lectures should have been inaugurated by His Highness who is a firm believer in the truths proclaimed in the Vedānta as expounded by Śankara. His two lectures here give in brief the leading tenets Vedānta; the first traces the Vedic roots and the second dwells upon the values of Human Life in Hindu Thought. After pointing out the antiquity and the enduring nature of this thought, His Highness draws attention to its leading characterestics, its basis in reason, the unity underlying its plural approach, the spiritual basis, and the emphasis on equipment and *adhikāra*; other concepts explained here are *Karma* and *Saṁsāra*, the *Āsrama-dharmas*, the three *Guṇas*, and the four *Puruṣārthas*. In the second lecture, which is mainly based on the Gītā, it is shown how

"the *Gītā* gives man a new outlook on his work and integrates religion and social service". The Gītā ideal of *Dharma* and *Niṣkāmakarma* is explained and emphasis is laid on how without '*Adhyātma* or spirituality' 'mere ethics, individual or social, will wither away' and how it is *Brahman* which is the ultimate *lakṣya.*

We are greatly indebted to His Highness for the mission he has undertaken for the authentic exposition of the ideals and teachings of the Vedānta.

V. RAGHAVAN

VISHNU SMRTI WITH THE COMMENTARY KESAVA-VAIJAYANTI OF NANDA PANDITA. Edited by Pt. V. Krishnamacharya. 2 parts. Adyar Library Series 93. Adyar Library & Research Centre, Madras 20. Rs. 40.

The *Viṣṇu* is one of the important Smṛtis, in prose Sūtras and verses, the original version of which Kane places between B.C. 300-100. It has large portions common with Manu and the Kāṭhaka gṛhya to whose Śākhā it belongs. Quotations from it are not found before Viśvarūpa. It was commented upon by Nanda alias Vināyaka Paṇḍita who lived in last quarter of the 16th and former part of the 17th centuries in Banaras. He was patronised by Keśava Nāyaka and by two other chiefs in North India. He and his patron in whose name he inscribed the commentary on Viṣṇu as Keśava-vaijayantī hailed from Karnataka. Nanda Paṇḍita wrote about nineteen works in this field and his work on adoption, *Dattakamīmāṁsā* and the present commentary, are the most important works of his. Nanda Paṇḍita became an authoritative exponent of the Banaras school. His life has been recounted in a work called *Dharmādhikārivaṁśavarṇana* by a descendant of his.

The Viṣṇu Smṛti has been edited more than once and Dr. Jolly's well-known edition carried extracts from the commentary of Nanda Paṇḍita (1181). When the late Professor K. V. Rengaswami Aiyengar, after his retirement, took great interest in Dharma Śāstra studies and during the years when he was closely associated with the work of the Adyar Library, he undertook to prepare a critical edition of the *Viṣṇu* with *Keśavavaijayantī* and I had, from the material of the New Catalogus Catalogorum, supplied a list of the

available manuscripts needed for the work. After 1943-44, the work was dropped and was taken up again recently under the scheme of the Ministry of Education for aiding the edition and publication of rare manuscripts texts. The present edition based on twelve manuscripts has been carried out by Pt. V. Krishnamacharya of the Adyar Library. The commentary reflects the wide learning, as also the independent outlook of Nanda Paṇḍita. Of the extensive quotations he makes, those from some little known works, particularly on the use of flowers for worship, may be noted: *Puṣpasāra* (p, 713), *Tattvasāgara* (714) and *Ratnakośa* (p. 714) on some other materials of worship. On places specially meritorious for performing Śrāddha (Ch. 85), the text comes down as far south as Godāvarī and it is interesting to note that the only other specific South Indian site mentioned by the text here is *Dakṣiṇa Pañcanada* (85.55) which the commentary identifies as the region in Karnatak watered by Kṛṣṇā, Veṇā, Tuṅgā, Bhadrā and Koṇā,—the region to which his family originally belonged. According to the commentator the interesting list of 96 names of the Lord given in Ch. 98 indicate that the text of the Viṣṇu Smṛti comprised only 96 Chapters. In Chapter 99 Lakṣmī speaks to Bhūmi on the places and persons where she abides and the ideas and verses here bear close similarity to those on the subject in Ch. 32 of the Anuśāsana of the *Mahābhārata*, Kumbhakonam edn.

The edition has been carefully prepared with the useful indexes at the end. The index of words in the Sūtras should have been complete and not select. If words beginning *Sūtras* or *Ślokas* or their *ardhas* or *pādas* are printed in antique, there is a way of integrating the Index of the text and the *Index Verborum* and saving space. The two take here forty pages.

The Adyar Library and the Vasanta Press are to be congratulated on their excellent production.

V. RAGHAVAN

VADIRAJA'S YASODHARACARITA WITH LAKSMANA'S SANSKRIT COMMENTARY. Edited by Dr. K. Krishnamoorthy. Published by Karnataka University, Dharwar, in 1963. Price Rs. 5.

This is a short poem in four contos depicting the cycle of rebirths undergone by King Yaśodhara and his mother Candramatī of Ujjain as a result of their contemplated

violence and their ultimate redemption on their becoming religious-minded. The author is Vādirāja, the celebrated Jaina poet and plilosopher. The poem was edited in 1912 by T. S. Kuppuswami Sastri and T. A. Gopinath Rao and published in the Sarasvatī Vilās Series, Tanjore. But the text of it was prepared with help of three Mss. only. The present edition is based on eleven Mss. procured from Mūdabidre, Mysore, Poona and Arrah (Bihar), besides the printed edition.

The Commentary accompanying the text is by Lakṣmaṇa, a resident of Kṣemapura (Gerasoppe in North Kanara) and is for the first time edited here. It is based on four Mss., all in Kanaada characters, procured from Dānaśālā Maṭha, Mūdabidre. Besides serving as a useful guide to the text the Commentary throws fresh light on the Kannada writers Rāghavāṅka and Nāgavarma, the former as the author of an unknown Sanskrit work (Vide II.68) and the latter as the author of a Sanskrit lexicon (III.13). The commentator gives a few Kannada equivalents of Sanskrit words (Vide I.23; IV.17, 20).

An English translation of the whole poem by the editor adds to the usefulness of the publication.

In his introduction in English, the editor discusses the date and place as also life and works of Vādirāja. He contradicts others' views or supports his own with the help of extensive quotations. He has also collected extracts from inscriptions in Sanskrit and Old Kannada eulogising Vādirāja, besides the colophons from Vādirāja's own words. There is a synopsis of the poem. The indebtedness of Vādirāja to Hariṣeṇa is shown by drawing parallel readings from Hariṣeṇa's Yaśodhara-Candramatī-Kathānaka. The foot-note (P. 75) contains a few rare forms and expressions used by the author. Details about the commentator are also given.

There are three indices: The first one is of verses in the text, the second of the works and authors cited in the commentary and the third of the authors and works referred to in the introduction. Dr. A. N. Upadhye, the well-known Jain scholar contributed a Foreword.

Notwithstanding its merits, the publication, is not free from flaws. Orthographical errors have crept in (*vide* P. 91 line 20; p. 92.9; p. 132.fn. 8; P. 135.1; P. 198.20

etc.) which are not included in the Errata. Similar errors are seen in the short German passage quoted from Dr. J. Hertel. This passage actually occurs on page 147 of the quoted Leipzig edition and not on P. 146 as has been quoted in the foot-note (P. 6). The date quoted by Dr. Saletore on P. 348 of his *Mediaeval Jainism* is A.D. 1539 and not A.D. 1939 (p. 81). The reference on P. 85, line 20, should be IV-20 and not III-20. To facilitate easy reference, the canto nos. should have been noted on each page in the Translation portion also.

SURYANARAYANA RAO

SĀMAVIDHĀNA BRĀHMAṆA. With the commentaries of Sāyaṇa and Bharatsvāmin. Edited by Dr. B. R. Sharma, Director, Central Sanskrit Institute, Tirupati. With a Foreword by Dr. V. Raghavan, Chairman, Central Sanskrit Institute, 1964. Rs. 15.

'वेदानां सामवेदोऽस्मि' इति श्रुतिस्मृतिभ्यां प्रथितप्रभावे सहस्र-शाखात्मके सामवेदे कौथुमशाखैव प्रचुरतरमुपलभ्यतेऽस्मद्देशे । तस्यां शाखायां पूर्वार्चिकः, उत्तरार्चिकः, तत्तत्पदपाठः, सप्तगानात्मकः प्रकृतिभागः, सप्ततन्त्रात्मकः ऊहरहस्यभागश्च मन्त्रभागस्संरक्ष्यत इदानीमपि अध्ययनपरम्परया । "गायत्रं प्रथमं गानमाग्नेयं तु द्वितीयकम् । तृतीयमैन्द्रं गानं स्यात् पावमानं चतुर्थकम् । अर्कद्वन्द्वव्रतं चेति पञ्चमं गानमुच्यते । षष्ठं च शुक्रियं गानं महानाम्नी च सप्तमम्" ॥ इति सप्तगानानि । दशरात्रसंवत्सरैकाहाहीनसत्रप्रायश्चित्त-क्षुद्रात्मकास्सप्ततन्त्राः । एतेषां क्रतुष्वेवोपयोगात् क्रतुनामधेयेनैव नामधेयानि विराजन्ते । ब्राह्मणभागश्चाष्टधा विभक्तः । अत्र प्राचां वचनम् "अष्टौ हि ब्राह्मणग्रन्थाः प्रौढं ब्राह्मणमादिमम् । षड्विंशाख्यं द्वितीयं स्यात्ततस्सामविधिर्भवेत् ॥ आर्षेयं देवताध्यायो भवेदुपनिषत्ततः । संहितोपनिषद्वंशो ग्रन्था अष्टावितीरिताः" ॥ इति । अत्र तृतीयं सामविधानाख्यं ब्राह्मणं श्रीसायणाचार्य-विरचितवेदार्थप्रकाशेन श्रीभरतस्वामिकृतपदार्थमात्रविवृत्त्या च सहितं पाठ-भेदादिभिः संशोध्य तिरुप्पतिक्षेत्रस्थकेन्द्रीयसंस्कृतविद्यापीठनिर्देशकैः डा० बे. रामचन्द्रशर्ममहोदयैः, विनियुज्यमानानां साम्नां स्थलसंकेतनिर्देशपूर्वकम् अप्रसिद्धपदानामर्थाविष्करणपुरस्सरं च स्थूलाक्षरेण मुद्रापयित्वा प्रकाशितमिति सुतरां सन्तुष्यति सामवेदिनां स्वान्तम् । प्रकाशमलभतेदं ब्राह्मणं नैतावता कालेन व्याख्याद्वयोपतं संस्कृतं च पाठभेदादिभिः । अत इदं परमोपकाराय भवति वेदार्थपरिज्ञानाय प्रवर्तमानानाम् ।

अत्र दृष्टार्थसाधनानामदृष्टार्थसाधनानां च विनाऽयासं कर्तुं शक्यानां जपरूपाणां होमरूपाणां च प्रयोगाणां बहुलमुपलम्भादिदं ब्राह्मणमवश्यं विज्ञेयं भवति सुखजीवनकामानां स्वर्गादिप्रेप्सूनां च ।

अस्मिन् प्रथमतः प्रपञ्चसृष्टिमुपवर्ण्य सृष्टानां देवादीनामोषधिवनस्पत्यन्तानां भूतानां जीवनसाधनत्वेन सामवेदं प्रायच्छत् प्रजापतिरिति वर्ण्यते। क्रतुकरणे शक्तिविहीनानामजपृश्न्यादीनां स्वाध्यायाध्ययनं तपश्च स्वर्गादिसाधनमित्युपवर्ण्य ताभ्यां स्वर्गं लोकं प्राय ँस्त इत्यादि प्रतिपाद्यते ।

स्वाध्यायेन दृष्टादृष्टार्थफलप्रेप्सूनां तत्तत्सामजपहोमादिप्रयोगानुष्ठाने योग्यतासंपादनाय कृच्छ्रादिस्वरूपं नियमविशेषविशिष्टं सविस्तरं विधीयते। श्रुतिरूपमिदमेव प्रमाणमादृत्य मनुयाज्ञवल्क्यादिभिः कृच्छ्रादिस्वरूपमुपदिश्यते—"त्र्यहं प्रातः त्र्यहं सायं त्र्यहमद्यादयाचितम्" इत्यादिना । कृच्छ्राद्यनुष्ठानतः क्षिप्रं फलं कामयमानानां सत्यवदनरौरवयौधाजयसामप्रयोगत्रिषवणस्नानतर्पणोपस्थानस्थालीपाकहोमादयः इतिकर्तव्यताविशेषाः अत्रैव विधीयन्ते । गौतमादिभिर्महर्षिभिरिदमेव विस्तरशः प्रतिपाद्यते ।

ब्राह्मणमिदं ब्राह्मणान्तरेभ्यो विशिष्यते । यतोऽत्र कायक्लेशसाध्यानां बहुदिनमाससाध्यानां यज्ञानां फलानि सामजपेनैव लभ्यन्त इति प्रतिपाद्यते। अपि च दृष्टफलसाधनानां प्रयोगाणां सामजपानां च विधानमत्रैव दृश्यते ।

तथा हि—सर्वैरभिलषणीयं दीर्घायुष्ट्वमरोगता च अबोध्यग्निरित्यादिना (2-1) द्वादशसामात्मकेनारिष्टवर्गेण निर्दिष्टनियमोपेतेन शतवर्षजीवित्वं जराप्रयुक्तक्लेशराहित्यं च भवति । उदुत्तममिति सदा प्रयुञ्जानस्य जरादिबाधानिवृत्तिः । पिशाचब्रह्मराक्षसादिग्रस्तस्य तन्मोचनसाधनत्वेन "अथ यो रक्षसा गृहीतस्स्यात्" (2-2) इत्यादिना प्रयोगोऽभिधीयते । एवं सर्पभयशस्त्रभयविषभयराहित्याय प्रयोगा अभिधीयन्ते । दुश्चिकित्स्यस्य राजयक्ष्माख्यमहारोगस्य निवारणाय "अचोदस इति तृतीयं प्रयुञ्जानो नैनं यक्ष्मा गृह्णाति" (2-3) इति सामजपः श्रूयते । "उद्यतशस्त्रान् शत्रून् दृष्ट्वा" इत्यादिना (2-4) प्रत्यक्षदृष्टशत्रुभयनिवर्तकसामजपविशेषं विदधाति ।

एवम् इष्टप्राप्तिप्रयोजकाश्च बहुलमुपलभ्यन्ते । "अथातः पुत्त्राणां नि त्वा नक्ष्य नि त्वामग्ने इत्यादि" (2-8) "प्रयुञ्जानः सुरूपान् दीर्घायुषः पुत्रान् लभते" इति सौन्दर्यबुद्धिसामर्थ्यदीर्घायुष्ट्वविशिष्टपुत्रप्राप्तिसाधनं सामजपो विधीयते ।

यशःप्राप्त्यर्थं श्रीप्राप्त्यर्थं, प्राप्तस्य हिरण्यधान्यादेः वृद्ध्यर्थम् अलक्ष्मीनिर्हरणार्थं च प्रयोगोऽभिधीयते ।

ग्रामस्य स्वाधीनताकरणम् एकपुरुषस्य स्त्रिया वा वशीकरणं कन्यायाः सत्पतिलाभः पुरुषस्य अनुकूलदारलाभः इत्यादिफलसिद्धये सेतिकर्तव्यताकाः प्रयोगाः उपलभ्यन्ते ।

जन्मान्तरपरिज्ञानं देवपितृदर्शनं भूमिस्थनिधिपरिज्ञानमित्येतादृशानां प्रयोगोऽपि दृश्यते । अन्ते देवताप्रत्यक्षजनकं पुनर्जन्माभावसाधनं, "रात्रिं प्रपद्य" इति मन्त्रसाध्यं रात्र्युपासनं किंचित् विधीयते । एतदधिकृत्य दुर्गाचन्द्रकलास्तुतौ दुर्गापरमेश्वरीम् अस्तुवन् श्रीमदप्पय्यदीक्षितेन्द्राः ।

"रात्रिं प्रपद्य इति मन्त्रविदः प्रपन्नान्
उद्बोध्य मृत्युवधिमन्यफलैः प्रलोभ्य
बुध्वा च तद्विमुखतां प्रतनं नयन्तीम्
आकाशमादिजननीं जगतां भजे ताम्" ॥ इति ॥

एवं दृष्टफलसाधनतया बहुप्रकाराः तत्तन्मन्त्रसाध्याः जपहोमात्मकाः प्रयोगाः ऋग्विधानादौ दृश्यन्ते । अथापि शौनकादिमहर्षिप्रणीतत्वात्पौरुषेयं स्मृतिरूपमृग्विधानादि । इदं तु सामविधानब्राह्मणं श्रुतिरूपत्वात् प्रबलं प्रमाणमिति एतद्विहितानां प्रयोगाणां प्रशस्ततमत्वमभ्युपेयम् । प्रामाण्यपरीक्षायां स्मृत्यपेक्षया श्रुतेर्बलीयस्त्वात् ॥

अत्र भरतस्वामिकृतपदार्थमात्रविवृतेः प्रायेण सायणभाष्यस्य च समानम् अर्थविवरणं दृश्यते । अथापि क्वचित् क्वचित् सायणानुक्तोऽपि विशदतया स्फुटीक्रियते ।

तथाहि "नमोऽहमायेत्यादिभिश्चतुर्भिर्मन्त्रैरुभयतो नमस्कारैः" इति (पृष्ठे, 23. 14, 28 पङ्क्तौ, 9) उभयतो नमस्काराः मन्त्रा इति स्पष्टं सायणाचार्यैः नोक्तं न मुद्रितं चात्र, शुद्धाशुद्धपट्टिकायां समीकृतम् । "तृतीयं चरित्वा सर्वस्मादेनसो मुच्यते" इत्यत्र सर्वशब्देन महापातकान्यपि गृह्यन्त इत्युक्त्वा, स्मृतिषु द्वादशाब्दकृच्छ्रानुष्ठानं महापातकनिवर्तकत्वेन विहितमनर्थकं स्यात् द्वादशरात्रकृच्छ्रानुष्ठानस्य तन्निवर्तकत्वाभ्युपगमे इत्याशङ्क्य रहस्यप्रमादादिकृते एतत्प्रायश्चित्तम् इति व्यवस्था कृता (31—12) ।

"अस्य प्रेषेति पांशुकानि" (1-3-9) इत्यत्र अस्य प्रेषेति ऋचि उत्पन्नं सामषट्कं विस्तरशः विवृतम् (44-16) ।

"सर्वं प्रयुञ्जानस्सहस्रसंवत्सरमाप्नोति" (1-4-12)-अत्र व्याख्याने सहस्रसंवत्सरसाध्यसत्रावाप्तेस्त्रैविध्यं स्पष्टमुपपादितम् । (55-12) सायण-व्याख्यायां सहस्रसंवत्सरसत्रप्राप्तिस्त्रिविधा, एकवारसंहिताध्ययनसाध्या इत्याद्युक्तं तदसंगतमिव भाति । उत्तरत्र वर्षचतुष्टयपर्यन्तमन्वहं प्रयुञ्जानः इत्युक्तत्वात् । वर्षचतुष्टयम् अन्वहमेकावृत्तिः, एवं क्रियमाणे सहस्राधिक-संख्यासद्भावात् (54-12) ।

"भारद्वाजिकाया जिह्वामुत्थाप्य" (2-7-8) अत्र भारद्वाजिका नाम रक्तपक्षः पक्षिविशेषः 143-2 इति स्पष्टं निरूप्यते ।

सदा भोजनस्योपनीतस्याप्रमग्नौ (33-2) औपासने पचने वा इत्युक्तम् । सायणपक्षे औपासनाभावे होमस्य बलेश्च लोप एव स्यात् । अस्मिन् पक्षे पचनाग्नौ होमः सर्वेषामपि स्यात् (166-5) ।

तदधीनश्च भवेत् (3-5-4) तत्प्रेरितः कर्माणि कुर्वीत इति स्पष्टं व्याख्यातम् । गौतमधर्मसूत्रेऽपि पुरोहितवरणानन्तरं तत्प्रसूतः कर्माणि कुर्वीत इति राजधर्मप्रकरण उक्तम् ।

"रात्रिं प्रपद्ये" (3-8-2) इति मन्त्रव्याख्याने पदानाम् अर्थविशेषवर्णनमध्याहारं कृत्वा वाक्यार्थनिर्णयः इत्यादिकं सुखबोधाय भवति । (205) "आभिप्रायिकं कर्म" 3-9-7-अत्र व्याख्यानं श्लिष्टतरं भवति ।

ग्रन्थेऽस्मिन् कुत्रचित् पदलोपः अक्षरलोपः तयोर्विपरिणामः पूर्वापरीभावव्यत्ययः इत्यादिकं दृश्यते । तच्च लेखकप्रमादाद्वा मुद्रणसमयेऽनवधानाद्वा स्यात् । शुद्धाशुद्धपट्टिकायामपि न समीकृतो दृश्यते ।

पृष्ठं पङ्क्तिः

3. 4- मायया विभा० इत्यत्र माययाऽविभा० इति प्रश्लेषः कार्यः ।

21. 13- शब्दादिलक्षणार्थः इत्येतत् प्रमादादायातः ।

25. 6- वैचित्र्यं इत्यस्य स्थाने वैचित्यं इति स्यात् ।

28. 7- स्नानकार्यं इत्यस्य स्थाने स्नानं कार्यम् इति स्यात् ।

„ 19- द्वितीयस्य कृच्छ्रयेत्यादिस्थाने, द्वितीयस्य अतिकृच्छ्रस्य कृच्छ्रधर्मान् अतिदिशतीति स्यात् ।

30. 6- त्रयाणाम् इत्यनन्तरं अन्तिम इति पठितव्यम् ।

„ 16- अनिरुक्तम् इत्यत्र अतिरिक्तम इति पठितव्यम् ।

40. 13- "कार्यकारणत्वादित्यत्र" एककार्यकारणत्वादिति स्यात् । एकम् अपूर्वं प्रति कारणत्वात् उभौ दर्शपूर्णमासौ गृह्येते इति तदर्थः । विमर्शपट्टिकायां किंचिदिव ज्ञापितम् ।

43. 7- पुरस्तादित्यत्र परस्तादिति भवितव्यम् ।

46. 10- अविकृतिकौकिलीसंज्ञे—इत्यत्र चरककौकिलीसंज्ञे इति लेखनीयम् । द्राह्यायणसूत्रे त्रयोदशपटले चतुर्थखण्डे "सौत्रामण्यौ कौकिलीचरकसौत्रामणीति" कौकिल्यां सामगानं नेतरस्याम् इति सूत्रितत्वात् ।

पृष्ठं पङ्क्तिः

48. 14- अस्यामुत्पन्नम् इत्यत्र-आरभ्य उत्पन्नम् इति स्यात् ।

49. 16- „ „ „

50. 17- „ „ „

54. 8- सहस्रसंवत्सरसत्रप्राप्तिस्त्रिविधा । एकवारसंहिताध्ययनसाध्या इत्युक्तम् । उत्तरत्र विवरणावसरे वर्षचतुष्टयपर्यन्तम् अन्वहं प्रयुञ्जानः सहस्रसंवत्सरं सत्रम् अवाप्नोतीति विवृत्तम् । अतः एकवारेत्यस्य स्थाने पदान्तरेण भवितव्यमिति । पूर्वोक्तनियमविशिष्टसंहिताध्ययनसाध्या इति वा अन्यद्वा स्यात् ।

57. 4- य एतया पूर्वं देवाः-इत्यत्र य इत्यक्षरमसंगतम् । अथवा यत इति स्यात्-यतः देवाः अमृतत्वमायन् अतः इदानीमपि य एवं वेदेति संबन्धस्सुकरः ।

57. 7- एतां प्रयुञ्जन्निति प्रमादादायातं स्यात्, अत्राननिवतत्वात् ।

64. 4- गौरवाल्लाघवानुगमित्यत्र, गौरवलाघवानुगम् इति स्यात् ।

67. 5- सकृत्प्रयोगः इति स्थाने शतृप्रयोग इति भवितव्यम् । "लक्षणहेत्वोः क्रियायाः" इति पाणिनिना लक्षणार्थे शतुर्विधानात् ।

74. 11- विद्यावृत्यादिभिरित्यत्रविद्यावृत्तादिभिरिति भाव्यम् ।

75. 6- „ „

77. 4- रात्रौ तु ग्राम एव इत्यत्र रात्रौ तु जलसमीप एव इति भवितव्यम् ।

79. 2- त्रिश्चरन्निति स्यात्-इत्यत्र त्रिश्चरन्निति न स्यादिति भवितव्यम् । अन्यथा पक्षे जलसमीपवास एव न स्यात् । स च विहितः ।

83. 4- स्याभिशस्तादन्यस्य इत्यत्र स्याभिशस्तस्य इति स्यात् ।

„ 15- दाक्षिण्यादिना प्रतिषिद्धस्य इत्यस्य स्थाने दाक्षिण्यादिनाऽप्रतिषिद्धस्येति प्रश्लेषः कर्तव्यः ।

84. 45- प्राणाख्यम् अपानाख्यम् च आरण्यके द्वन्द्वपर्वारम्भे इति स्थलनिदर्शनं कार्यम् ।

86 19- सः ज्येष्ठः परिविन्दः । तपोऽतिकृच्छ्रत्रय, इत्यस्य स्थाने सः ज्येष्ठः परिविन्दः । सोऽपि कृच्छ्रत्रयकाले इति भवितव्यम् ।

95. 1- गृहपरिकरणे इत्यत्र गृहोपकरणे इति स्यात् ।

102. 10- किं हि वचनम्-इत्यत्र किमिव हि वचनम् इति स्यात् ।

पृष्ठ पङ्क्तिः

166. 5- भोजनस्यैकदेशः इति प्रमादकृतः । पंचमे वा इत्यत्र पचने वा इति भवितव्यम् ।

171 14- दिक्षु इत्यत्र देशे इति स्यात् ।

173. 6- अदृश्यभावात्-इत्यत्र अदृश्यभावाः इति स्यात् । अत एवेति प्रमादकृतः ।

182. 11- काल इत्यादिवाक्येन अन्येन भवितव्यम् ।

186. 10- तान्येव इत्यत्र तानेव इति स्यात् ।
कानिचिद्वाक्यानि पदानि वा समीकर्तुं न शक्यन्ते ।

यथापाठोपलम्भं मुद्रापितानि । एतादृशेषु दोषेषु अल्पेषु सत्स्वपि महता प्रयासेन संपादितमिदं महोपकाराय भवति ; अतः संपादकेभ्यः विद्यापीठाधिकारिभ्यश्च सश्लाघं कृतज्ञता निवेदनीया छन्दोगैस्सर्वैरिति शम् ॥

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228	स्तनौ सुस्त्रियोर्हौ	1	27	6	+ 8	
248	गङ्गा चारुकच्छा	1	26	33	+ 7	(निवृत्तिः)
268	रेवा चारुकच्छा	1	26	42	+ 7	

XIV. ४ D adds : चतुर्दशपरिवृत्ति-

XV. 30 A B D हरश्चन्द्राकृतिः; E हरे चन्द्रः 60. C E इभा for शुभा
A B धीरयस्थाः ; C धीरा यूथाः
110. D कण्ठो. A B रिज्ञो रथीः ; D रुन्दरथी. D धृता for रथी
185. B om. the vakya. C सत्यज्ञानी राजा ; D सत्यज्ञा नीरजा
213. A B ग्रामाः ; C होमः सत्रास्पदैः. A om. सत्रा
228. C स्तनास्थाः प्रियार्हाः 268. B om. the vākya.

Days	Vākya	r	o	,	Saṁskāra-varṇa
293	कण्वाः सत्रकथाः	1	27	41	+ 7
318	शीलधराः पार्थाः	1	29	35	+ 7
348	कवेः प्रज्ञा रसे	2	2	41	+ 7
363					(अस्तम्)
378	चण्डता नारीस्था	2	6	36	+ 7

(Δवाक्यं 19. ठ 'शक्यं' (15) शनेः)

परिवृत्तिः XVI

Days	Vākya	r	o	,	Saṁskāra-varṇa
15					(उदयः)
30	चण्डी नात्यरसा	2	10	36	+ 7
60	क्षोणी गोप्या रसे	2	13	56	+ 7
85	हेमाशयो राजा	2	15	58	+ 8
110	नित्यासूयो राजा	2	17	10	+ 8
130	चन्द्रेप्सुः पुरहा	2	17	26	+ 8 (वक्रः)
150	मुनेः सत्ये श्रद्धा	2	17	5	+ 9
165	नीरैस्तापरुद्धाः	2	16	20	+ 9
175	अविर्मेध्यः श्राद्धे	2	15	40	+ 9
185	कूर्मो भोज्यः श्राद्धे	2	14	51	+ 9
193	आर्या वन्द्या श्राद्धे	2	14	10	+ 9
203	जाया श्लाघ्यव्रीळा	2	13	18	+ 9
213	मूर्खः प्रायः क्रोधी	2	12	25	+ 9
228	छागो योग्यः श्राद्धे	2	11	37	+ 9

XV. 293. A B D कण्वः (D कण्वः) सत्रकथा 318. A B शिला; C शीला
348. A B D सर्वे प्राज्ञा. C रसा
Δ D adds: पञ्चदश परिवृत्ति- ठ E मान्यं for शक्यं

XVI. 85. A B C होमाशयो 110. B om. the vākya.
C E नित्यं सूर्यो रेजे 130. A B D चन्द्रे सुपराहैं. C पुरधीः
150. A B D मीने सत्यश्रद्धे 193. E om. the vākya.
A B आर्या विद्या श्रद्धा 203. E श्लाघ्या

Day	Vākya	r	°	′	Saṁskāra-varṇa
248	ज्ञानी कोपरोधी	2	11	0	+ 9 (निवृत्तिः)
268	मानयोग्यो राजा	2	11	5	+ 8
293	रत्नप्रियो राजा	2	12	2	+ 8
318	रामा श्लाघ्यारोहा	2	13	52	+ 8
348	हेमतुष्टाः प्रजाः	2	16	58	+ 8
363					(अस्तम्)
378	रामा नम्रा रेजे	2	20	52	+ 8

(△वाक्यं 19. 'तोयं' (16) शनेः)

परिवृत्तिः XVII

Day	Vākya	r	°	′	Saṁskāra-varṇa
15					(उदयः)
30	श्रीमान् वीरो राजा	2	24	52	+ 8
60	जायादाराः प्रजाः	2	28	18	+ 8
85	वारि नानाम्बुदे	3	0	24	+ 8
110	अर्भका निर्लज्जाः	3	1	40	+ 8
130	राज्ञि श्रीर्निबद्धा	3	2	2	+ 9 (वक्रः)
150	बिवर्ज्या निर्गन्धा	3	1	44	+ 9
165	तनुः पीनगळा	3	1	6	+ 9
175	वारि नानम्बुधौ	3	0	24	+ 9
185	इभो धीरः क्रोधी	2	29	40	+ 9
193	क्षीणाहारः क्रोधी	2	28	56	+ 9
203	गानार्हा रुद्रधीः	2	28	3	+ 9
213	मान्यः सूरिः श्राद्धे	2	27	15	+ 9

XVI. 318. C रामो लोके राजा 378. A B D रमा नम्रे
△ D adds: षड्दशपरिवृत्ति-

XVII. 60. A B C D जयदाराः 85. A B म्बुजे
130. A om. श्री 165. A B D तेनोत्पन्नगन्धा
185. A B D शुभधीरक्रोधी 193. A B क्षीणाधारः ; D क्षीणहरा

Days	Vākya	r o ′	Saṁskāra-varṇa
228	सूर्यश्चन्द्ररोधी	2 26 17	+ 9
248	हन्ते शूद्रश्रद्धा	2 25 38	+ 9
268	सांबः शूररोधी	2 25 37	+ 9 (निवृत्तिः)
293	खड्गतीव्रो राजा	2 26 32	+ 8
318	सकुञ्जरो राजा	2 28 17	+ 8
348	नारीपाने लज्जा	3 1 20	+ 8
363			(अस्तम्)
378	श्रीकामा नालसाः	3 5 12	+ 7

(१ वाक्यं 17. 'सत्यं' (17) शनेः)

परिवृत्तिः XVIII

15			(उदयः)
30	चापाधीनाम्बुदाः	3 9 16	+ 8
60	विश्वप्रिया गजाः	3 12 44	+ 8
85	ईशभार्याऽगजा	3 14 50	+ 8
110	प्रियतोया गजाः	3 16 12	+ 8
130	तीव्रेषु कलाहा	3 16 26	+ 8 (वक्रः)
150	रुद्राक्षे योगधीः	3 16 22	+ 9
165	गावः शष्पलुब्धाः	3 15 43	+ 9
175	सन्नाशया बुधाः	3 15 7	+ 9
185	क्रूरैर्वध्या गोधा	3 14 22	+ 9

XVII. 268. A शूरो रोधी

१ D adds सप्तदशपरिवृत्ति-

XVIII. 30. A B D पम्पाधीनेम्बुदे (A gap. for दे)

110. A gap for गजाः; E गोदा

175. A B बुद्धाः; E बोद्धाः 185. A gap for the last letter, धा

Days	Vākya	r o ,	Saṁskāra-varṇa
193	युवा श्लाघ्यो गन्धैः	3 13 41	+ 9
203	देवेन्द्राय गन्धाः	3 12 48	+ 9
213	धर्माढ्या योगधीः	3 11 59	+ 9
228	अज्ञाः पापा बौद्धाः	3 11 0	+ 9
248	वाह्या नृपगजाः	3 10 14	+ 8
268	सेना नृपगेहे	3 10 7	+ 8 (निवृत्तिः)
293	धर्मज्ञा योगार्हा	3 10 59	+ 8
318	युवा स्त्रियोल्लासी	3 12 41	+ 7
348	जले मत्स्योल्लासाः	3 15 38	+ 7
363			(अस्तम्)
378	शूरो धृष्टो गोप्ता	3 19 25	+ 6

(*वाक्यं 18. ♂ ' जयः ' (18) शनेः)

परिवृत्तिः XIX

Days	Vākya	r o ,	Saṁskāra-varṇa
15			(उदयः)
30	सारा गिरिलता	3 23 27	+ 6
60	वीणा तन्त्रीलता	3 26 54	+ 6
85	राज्ञो धीरो गोप्ता	3 29 2	+ 6
110	सूरिर्ज्ञानी वक्ता	4 0 27	+ 6
130	विष्णुर्ज्ञानोद्भासी	4 0 54	+ 7 (वक्रः)
150	शम्भुर्ज्ञानोद्भासी	4 0 45	+ 7

XVIII. 228. A B D पापबोधाः; D बुधा * D adds: अष्टादशपरिवृत्ति-
♂ E दीपः for जयः

XIX. 60. A B D तरु for तन्त्री 130. A B D कृष्णज्ञानोद्भासाः
(A gap for भा) 150. A B D शिवज्ञानभासाः; E शैवा
ज्ञानभासाः

Days	Vakya	r	o	'	Saṁskāra-varṇa
165	नार्यो नानावस्ताः	4	0	10	+ 7
175	रागो धरोल्लासी	3	29	32	+ 7
185	धवो दारोल्लासी	3	28	49	+ 7
193	नन्द्या हरिगाथा	3	28	10	+ 7
203	सेव्या सुखलिप्सा	3	27	17	+ 7
213	चारुतरा गाथा	3	26	26	+ 7
228	शूरे शस्त्रलिप्सा	3	25	25	+ 7
248	साला वरगुच्छाः	3	24	37	+ 7
268	सौख्ये भूरिलिप्सा	3	24	27	+ 7 (निवृत्तिः)
293	स्त्रियः स्मरलक्षाः	3	25	12	+ 6
318	अणुतरा लता	3	26	50	+ 6
348	धीगा धीरगुणाः	3	29	39	+ 5
363					(अस्तम्)
378	नारी गानवशा	4	3	20	+ 5

(ϑवाक्यं 19. †'धन्यं' (19) शनेः)

परिवृत्तिः XX

Days	Vakya	r	o	'	Saṁskāra-varṇa
15					(उदयः)
30	सूर्यस्थानभावाः	4	7	17	+ 4
60	विश्वज्ञः कुम्भभूः	4	10	44	+ 4
85	गुणाः प्रिया विभोः	4	12	53	+ 4
110	सूर्यो वैद्यो भावी	4	14	17	+ 4

XIX. 175. C राग for रागो
203. C सत्कथाः खलु सा 318. A B C D लता
ϑ D adds एकादशपरिवृत्ति- † धान्यं
XX. 85. A B C गुणप्रियो. A B D विभूः ; C विभो
110. A B D भोगी. C सूर्ये वेद्या भावाः

Days	*Vakya*	*r o ,*	*Samskara-varna*
130	शिवा वन्द्या विश्वैः	4 14 45	+ 4 (वक्रः)
150	चण्डी त्वार्यभावा	4 14 36	+ 4
165	वने वायुर्ववौ	4 14 4	+ 4
175	दाराः श्लाघ्यभावाः	4 13 28	+ 4
185	स्तवप्रिया भावाः	4 12 46	+ 4
193	दिनप्रियो भास्वान्	4 12 8	+ 4
203	लोकपूज्यो विद्वान्	4 11 13	+ 4
213	चन्द्रो नित्यं भास्वान्	4 10 26	+ 4
228	गुरुधनो विद्वान्	4 9 23	+ 4
248	खड्गी दानवोऽश्वी	4 8 32	+ 4
268	पुरादानो विद्वान्	4 8 21	+ 4 (निवृत्तिः)
293	धीमान् जने विद्वान्	4 8 59	+ 4
318	अङ्गनेड्या भावैः	4 10 30	+ 4
348	मान्यो लोके विद्वान्	4 13 15	+ 4
336			(अस्तम्)
378	सत्त्वतुष्टो वाली	4 16 47	+ 3

(*वाक्यं 19. 'नरः' (20) शनेः)

परिवृत्तिः XXI

15			(उदयः)
30	श्रीमानिन्द्रो वज्री	4 20 52	+ 2
60	यज्ञे विप्रा वराः	4 24 1	+ 2
85	हीनास्तीव्रवीराः	4 26 8	+ 2

XX. 185. A B D सुखप्रिया
248 A B D खड्गदानभावाः 293. A B D E श्रीमान् दाने विभुः
378. A सत्त्वकष्टो * D adds विंशत्परिवृत्ति-

Days	Vakya	r	o	,	Samskara-varna	
110	यागसारा विप्राः	4	27	31	+ 2	
130	पूर्णं सरो वारा	4	27	51	+ 2	
150	गुणसारो वज्री	4	27	53	+ 2	(वक्रः)
165	खराः सान्द्रभाराः	4	27	22	+ 2	
175	शिवाचारा विप्राः	4	26	45	+ 2	
185	सन्नतरो वैरी	4	26	7	+ 2	
193	नागशूरो वज्री	4	25	30	+ 2	
203	स्थूलाश्वाः प्रवीराः	4	24	37	+ 2	
213	सेवा गुरोर्वरा	4	23	47	+ 2	
228	विश्वश्रीरुर्वरा	4	22	44	+ 2	
248	पद्माच्र्या प्रवीरैः	4	21	51	+ 2	
268	शीलपरा विप्राः	4	21	35	+ 2	(निवृत्तिः)
293	स्त्रियः श्रेष्ठा वस्त्रैः	4	22	12	+ 2	
318	छागा गुरु भोज्याः	6	23	37	+ 1	
348	तर्कस्तीव्रविद्या	4	26	16	+ 1	
368						(अस्तम्)
378	विप्रेद्धाः प्रवर्ग्याः	4	29	24	+ 1	

(४ वाक्यं 19. 'पुत्रः' (21) शनेः)

परिवृत्तिः XXII

Days	Vakya	r	o	,	Samskara-varna	
15						(उदयः)
30	अबला नर्मकृत्	5	3	30	— 1	

XXI. 110. E योग 130. C पूर्णसारा वीराः 175. C शुभाचारा
193. C नय and E नग for नाग 213. A B D विश्वरुद्रा वराः
293. A B D श्रेयः श्रेष्ठवस्त्रैः. E श्रेष्ठवस्त्राः 378. C D E विप्रेद्धः
C E प्रवर्ग्यः ४ D adds एयविंशत्परिवृत्ति-

Days	Vakya	r o ,	Saṁskāra-varṇa
60	शिवार्चनं मुख्यम्	5 6 45	— 1
85	जम्भजिन्नः शत्रुः	5 8 48	— 2
110	सन्नो नृपशत्रुः	5 10 7	— 2
130	माली नित्यं शूरः	5 10 35	— 2 (वक्रः)
150	चोरो नित्यं शत्रुः	5 10 26	— 2
165	क्षमेद्धो निश्शत्रुः	5 9 56	— 2
175	इन्द्रघनं मखः	5 9 20	— 2
185	स्त्रीवदनं स्मेरम्	5 8 42	— 2
193	मानहीनोमूर्खः	5 8 5	— 2
203	भूपः सेनाशूरः	5 7 14	— 2
213	चारु स्तनमुखम्	5 6 26	— 2
228	गिरीशानो मेरुः	5 5 23	— 2
248	नागो वने शूरः	5 4 30	— 2
268	चापभिन्नः शत्रुः	5 4 16	— 2 (निवृत्तिः)
293	शिवोद्विग्नो मारः	5 4 45	— 2
318	नित्यं स्तेनो मूर्खः	5 6 10	— 2
348	विद्वान् दानोन्मुखः	5 8 44	— 2
363			(अस्तम्)
378	मुनिः प्रियमन्त्रः	5 12 5	— 2

(৪ वाक्यं 19. 'श्रेष्ठः' (22) शनेः)

XXII. 85. A gap for जिन्नः श 165. A न शत्रुः
185. A B D शिवदानं स्मारम्। 208. E चापे भिन्नः. A शूरः and E शरः for शत्रुः 293. A. B मारः for मेरुः
348. B om. the vākya. ৪ D adds. द्वाविंशत्परिवृत्ति-

परिवृतिः XXIII

Days	*Vākya*	*r o ,*	*Saṁskāra-varṇa*
15			(उदयः)
30	स्तवैर्मान्यः शौरिः	5 15 46	— 2
60	तृष्णाजयी शम्भुः	5 18 56	— 4
85	क्षमी नरः शुभः	5 20 56	— 4
110	प्रियरुद्रः शैवः	5 22 12	— 4
130	चण्डः क्रूरः शिवः	5 22 36	— 4 (वक्रः)
150	चन्द्रः श्रेष्ठशोभः	5 22 26	— 4
165	ईशः परशुभृत्	5 21 50	— 4
175	निद्रापरो मूढः	5 21 20	— 4
185	नवनीरो मेघः	5 20 40	— 4
193	घननीरो मेघः	5 20 4	— 4
203	वन्द्यो धन्यैश्शिवः	5 19 14	— 4
213	क्षीरदाः पशवः	5 18 26	— 4
228	शास्त्रार्थः कर्णभृत्	5 17 25	— 4
248	गङ्गातोयं शिवम्	5 16 33	— 4
268	दिव्यतोयो मेघः	5 16 18	— 4 (निवृत्तिः)
293	अमृतः कृष्णवित्	5 16 50	— 4
318	प्रियजायश्शम्भुः	5 18 12	— 4
348	श्रीघनो रुक्मभृत्	5 20 42	— 4
363			(अस्तम्)
378	नुन्नाश्वो रणवित्	5 24 0	— 4

(*वाक्यं 19. ♀'गुरुः' (23) शनेः)

XXIII. 110. A B प्रियो रुद्रः शिवः D शिवः- and E पुराशीमः for परशुभृत् 228. A B D शस्त्रसङ्कीर्णभूः 165. A B D परशोभः 213. B om. the vākya.

* D adds. त्रयोदश (? विंशत्) परिवृत्ति- ♀ E गिरिः

परिवृत्तिः XXIV

Days	*Vākya*	*r*	*o*	*'*	*Saṁskāra-varṇa*	
15						(उदयः)
30	सङ्गस्थो रमणः	5	27	37	— 5	
60	इभो नूनं तिग्मः	6	0	40	— 5	
85	वल्गू राज्ञः स्तुतिः	6	2	34	— 6	
110	तृष्णालग्नं चित्तम्	6	3	56	— 6	
130	धनवान्नीतिस्थः	6	4	9	— 7	(वक्रः)
150	समगो नीतिस्थः	6	3	57	— 7	
165	रुद्रो गानतीर्थः	6	3	22	— 7	
175	अमरो नीतिच्छुः	6	2	50	— 7	
185	दीनप्रज्ञस्तुच्छः	6	2	8	— 7	
193	यौगिकोऽनन्तार्थः	6	1	31	— 7	
203	रेवा स्नानतीर्थः	6	0	42	— 7	
213	गुणधारीन्मर्थम् (?)	5	29	53	— 7	
228	समोदो रामस्थः	5	28	57	— 7	
248	सर्पजः प्रमाथः	5	28	17	— 7	
268	वामी सान्द्रशीधुः	5	27	54	— 7	(निवृत्तिः)
293	शूरा हरमूर्तिः	5	28	25	— 6	
318	शिवो धीरः शक्तिः	5	29	45	— 6	
348	शिष्यः प्राज्ञस्स्तुतः	6	2	15	— 6	

XXIV. 30. C सङ्गार्थी रमणः 60. A B E ननु for नूनं
110. A B लग्नं चित्ते C लग्नचित्थः 150. C D E सामगो D नीतीप्सुः
193. C योगाढ्योः ; D योगिको 203. B om. the vākya.
213. A B E धारीशस्वः ; D धरीन्मथः 228. C रामार्थः ; D रामातः
248. C E सर्पार्हः 348. A प्रज्ञः ; C E पज्ञा

Days	Vakya	r	o	,	Samskara-varna
363					(अस्तम्)
378	रागी मानाश्चितः	6	5	32	— 6

(ॐवाक्यं 19. 'वीरः' (24) शनेः)

परिवृत्तिः XXV

Days	Vakya	r	o	,	Samskara-varna
15					(उदयः)
30	राज्ञां धनं ततम्	6	9	2	— 6
60	ज्ञानी प्रियातिथिः	6	12	0	— 7
85	रामो लङ्कार्तीच्छुः	6	13	52	— 7
110	यज्ञेशः कीर्तिदः	6	15	1	— 8
130	नरेशः कीर्तिदः	6	15	20	— 8 (वक्रः)
150	धनेशः कीर्तिदः	6	15	9	— 8
165	धराभृत् कुन्तार्हः	6	14	29	— 8
175	तीक्ष्णो लोकार्तिदः	6	13	56	— 8
185	तपो लोकार्तिदः	6	13	16	— 8
193	जगच्छ्रीः कान्तिदः	6	12	38	— 8
203	देवेड्यः कीर्तिदः	6	11	48	— 8
213	नूनं कुपितोऽहिः	6	11	0	— 8
228	स्तेनो नित्यार्तिदः	6	10	6	— 8
248	धैर्येद्धोऽनन्तार्हः	6	9	19	— 8
268	नृपो धनेऽतीहः	6	9	10	— 8 (निवृत्तिः)
293	खलो धने तुच्छः	6	9	32	— 7

XXIV. ॐ D adds: चतुर्विंशतिपरिवृत्ति-

XXV. 150. A B D E सेनेशः कान्तार्हः 185. C चपलः and E तापोलो- for तपोलो- 193. C जगद्रूपं तर्हि 248. E for ईः

Days	Vākya	r	o	'	Saṁskāra-varṇa
318	स्त्री नित्यं पतीच्छुः	6	11	2	— 7
348	लोलाङ्गी पतीच्छुः	6	13	33	— 7
363					(अस्तम्)
378	दैवतं कृतार्थः	6	16	48	— 7

(८वाक्यं 19. 'शौरिः' (25) शनेः)

परिवृत्तिः XXVI

15					(उदयः)
30	सत्यं नः प्रीतिदम्	6	20	17	— 8
60	प्रियाङ्ग रतिदम्	6	23	12	— 8
85	धीमान् विरतीहः	6	24	59	— 8
110	मानितः प्रीतिदः	6	26	5	— 8
130	निद्रातुरश्चोळः	6	26	20	— 9 (वक्रः)
150	प्राज्ञतरश्चोळः	6	26	2	— 9
165	परं मन्त्रौषधम्	6	25	21	— 9
175	आत्मवान् प्रीतिद्धः	6	24	50	— 9
185	जनो वीरः स्तब्धः	6	24	8	— 9
193	अम्बु गिरिस्तब्धम्	6	23	30	— 9
203	शीलं श्रेष्ठौषधम्	6	22	38	— 9
213	क्षमापरश्चोळः	6	21	56	— 9
228	गानपरे ताळः	6	21	3	— 9
248	नरो निद्रास्तब्धः	6	20	20	— 9
268	नयनं रक्ताब्जम्	6	20	10	— 8 (निवृत्तिः)

XXV. 378. C कृतार्थम् ८ D adds. पञ्चविंशति परिवृत्ति-

XXVI. 130. C D E निद्रार्तो रतिद्धः 193. A B अलं for अम्बु

193. C E स्तब्धम् 268. A B D E रक्तार्धम्

Days	*Vākya*	*r o ,*	*Saṁskāra-varṇa*
293	सवनं प्रीतिदम्	6 20 47	— 8
318	जनः स्त्रीप्रीतिदः	6 22 8	— 8
348	राघवः प्रीतिदः	6 24 42	— 8
363			(अस्तम्)
378	सोमस्थः प्रीतार्हः	6 27 57	— 8

(♂ वाक्यं 19. 'चित्रं' (26) शनेः)

परिवृत्तिः XXVII

15			(उदयः)
30	मान्ययोनिः सिंहः	7 1 15	— 8
60	छाया भानुसुहृत्	7 4 17	— 8
85	पुनातु नृसिंहः	7 6 1	— 8
110	रत्नसानौ सिंहः	7 7 2	— 8
130	शय्यास्थानं सौधम्	7 7 15	— 9 (वक्रः)
150	क्षीणतनुः सुधीः	7 6 56	— 9
165	मान्यतनुः सिद्धः	7 6 15	— 9
175	जले मीनः सिद्धः	7 5 38	— 9
185	तृणं वने सिद्धम्	7 4 56	— 9
193	दण्ड्यो भग्नस्सिद्धः	7 4 18	— 9
203	अङ्गलग्नं सिद्धम्	7 3 30	— 9
213	सर्वं प्रज्ञासिद्धम	7 2 47	— 9
228	लक्ष्मीयोनिस्सिन्धुः	7 1 53	— 9
248	पुण्यं यज्ञ सिद्धम्	7 1 11	— 9

XXVI. 293. A B D सुवनं 378. C सोमसुत् प्रीतिदः
♄ D adds: षड्विंशतिपरिवृत्ति-

XXVII. 30. E मन्यु 130. D शिवासनं सुधीः 165. C सन्धिः
203. A B अङ्ग ; अङ्गी ; अङ्गे C E लग्नोत्सेधा ; D लग्नोत्सिद्धः

Days	Vakya	r o ,	Samskāra-varṇa
268	मुनिर्यज्ञोत्साहः	7 1 5	— 8 (निवृत्तिः)
293	विश्वं यज्ञोत्साहि	7 1 44	— 8
318	श्लाघ्याङ्गो नृसिंहः	7 3 13	— 8
348	सर्वमानस्सिंहः	7 5 47	— 8
363			(अस्तम्)
378	मानधनः सुस्थः	7 9 5	— 7

(ꣳ वाक्यं 19. ¥ 'सौरिः' (27) शनेः)

परिवृत्तिः XXVIII

15			(उदयः)
30	सूरिः प्रियः सत्सु	7 12 27	— 7
60	गिरिशयः सिंहः	7 15 23	— 8
85	मानेप्सुः कंसजित्	7 17 5	— 8
110	मनुर्जायोत्साहः	7 18 5	— 8
130	सौख्यदः कंसजित्	7 18 17	— 8 (वक्रः)
150	कामः साध्योत्साहः	7 17 51	— 8
165	पुण्यात् सौख्यसिद्धिः	7 17 11	— 9
175	रोगस्तापसिद्धः	7 16 32	— 9
185	धवो मान्योऽसळः	7 15 49	— 9
193	नित्यं मान्यः सिद्धः	7 15 10	— 9
203	श्रेष्ठवाक्यं साधु	7 14 22	— 9

XXVII. 293. C D विश्वे A B त्साहम् ; C त्साः
378. A B D मानी धनसंस्थः ; C मुनिधनं सार्थम् ;
ꣳ D adds: सप्तविंशातिपरिवृत्ति-। ¥ E सारं

XXVIII. 150. A B साज्योत्साहः ; C संख्यो ; 185. D मान्यो सद्धिः
203. C E श्रेष्ठभोगं सौधम् ।

Days	Vākya	r o ,	Saṁskāra-varṇa
213	इभः श्लाघ्योत्सेधः	7 13 40	— 9
228	हेमप्रियस्सिद्धः	7 12 58	— 9
248	उत्करः कुत्साहः	7 12 10	— 8
268	जनः स्त्रीकथेहः	7 12 8	— 8 (निवृत्तिः)
293	कामः प्रियासंस्थः	7 12 51	— 7
318	धृष्टो भूपः सासिः	7 14 19	— 7
348	धीमान् तपस्संस्थः	7 16 59	— 7
363			(अस्तम्)
378	क्रूरो नरः सासिः	7 20 22	— 7

(*वाक्यं 19. 'हरिः' (28) शनेः)

परिवृत्तिः XXIX

15			(उदयः)
30	जीवो गुरुसंस्थः	7 23 48	— 7
60	इभः क्षेत्रसंस्थः	7 26 40	— 7
85	नरो जरासंस्थः	7 28 20	— 7
110	जयेद्धो रथस्थः	7 29 18	— 7
130	शस्त्रेद्धो रथस्थः	7 29 25	— 7 (वक्रः)
150	धर्मो दुरासदः	7 28 59	— 8
165	तपो दुरासदम्	7 28 16	— 8

XXVIII. 213. A B D शुभः for इभः A B D श्लाघ्यः साधुः ; E श्लाघ्योत्साहः 228. C D होम 248. A B D उत्कारकुत्सहः 268. A B D स्त्रिया सह ; C दानप्रियोत्साहः ; E स्त्रीकथेह * D adds. अष्टविंशति परिवृत्ति-

XXIX. 30. A B D E जीवेद्गुरु सुतः (D जीवो) 60. A B D शुभः for इभः 165. A B D सादः

175	शूली सत्रोत्साह:	7 27 35	— 8
185	रामस्तरसार्हः	7 26 52	— 8
193	श्रीपतेः प्रसादः	7 26 12	— 8
203	विप्रो मन्त्रोत्साहः	7 25 24	— 8
213	राघवो रथार्हः	7 24 42	— 8
228	रुक्मगिरिः साहिः	7 23 52	— 8
248	चापाङ्गोरथस्थः	7 23 16	— 7 (निवृत्तिः)
268	मान्याङ्गो रसेच्छुः	7 23 15	— 7
293	धर्मो गुरुसंस्थः	7 23 59	— 7
318	चण्डा शत्रुसंसत्	7 25 36	— 7
348	नीरदो रसेच्छुः	7 28 20	— 7
363			(अस्तम्)
378	रवियोनिर्दासः	8 1 42	— 7

(⊕वाक्यं 19. 'धीरः' (29) शनेः)

आद्यन्तवाक्यप्रमाणं 'कामेशः' (551)⁎

॥ इति शनेर्महावाक्यं सम्पूर्णम् ॥

॥ इति कुजादिपञ्चग्रहवाक्यं समाप्तम् ॥ऌ

XXIX. 175. ABDE संखे सहः 185. C चन्द्रोत्साहः
193. A B प्रियस्तु प्रसादः 203. A B E मूर्खस्सेहः ; D मखोत्साहः
228. C रुक्माङ्गो रथार्हः 248. E चापो गोरथस्थः
378. D रागिगोनिर्दासः ⊕ D adds: एकोनविंशपरिवृत्ति-
⁎ A B C E do not have this line.
ऌ A does not have this colophon. B इति कुजादिपञ्चग्रह-वाक्यं परिसमाप्तम्। हरिः ओम्। D reads: इति वाक्यकरणे षष्ठाधिकारः। कुजादि-पञ्चग्रहवाक्यं समाप्तम्। कुजादि-मन्दान्तवाक्यं 'मासनेत्रः' (2075). शुभमस्तु। स्वभानुवर्षे वृषभमासं २९. कुजादिवाक्यं समाप्तम्। E adds: आहत्य सर्ववाक्यसंख्या 'मासनारिः' (2075). कुजस्य 570 ; बुधस्य 528 ; गुरोः 231 ; भृगोः 165 ; शनेः 551. आहत्य वाक्यानि 2075. भूमिजस्य परिवृत्तिः 15 ; बुधस्य 22 ; गुरोः 11 ; भृगोः 5 ; शनेः 29. हरिः ओम् ॥

VĀKYAKARAṆA

TRANSLATION AND NOTES*

प्रणम्य मातापितरौ भास्करार्यभटौ गुरू ।
विवृतिः क्रियते वाक्यकरणस्याङ्गभाषया ॥

CHAPTER I

THE SUN, MOON AND RĀHU

(Invocation)

1. After prostrating before the Lotus-eyed Effulgence enshrined at Kariśaila,[1] is composed this astronomical manual based on the works of Bhāskara.[2]

(The Days from the Kali Epoch)

2–3. [The S'aka year *plus* 3179 gives the Kali year.]

Multiply the Kali year elapsed by 365. Add a fourth of the years. Add to this the days, (nāḍikās etc.) got by multiplying the years by 5, deducting 1237 and dividing by 576. This gives the Kali days to the end of the True Solar year,[3] the first (Kali) day being a Friday.[4]

Example 1. *For the Śaka year gone 1869, find the Kali days for the beginning of the year Sarvajit, and for the end of the 24th day of Kanyā. Find also the New year's day.*

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*What is attempted here is rather a cogent and readable elucidation of this technical text with a direct presentation of the calculations involved than a literal rendering of the verses.

1. This is Hastigiri, another name for Kanchi in Madras State.
2. This is the earlier Bhāskara of *c.* 600 A.D. belonging to the Āryabhaṭan School. The works referred to are his *Laghubhāskarīyam* (Ed. *An.SS* 128; *TSS* 162) and *Mahābhāskarīyam* (*AnSS* 126; *Madras Gov. Or. S.* 130).
3. The Kali days are usually computed for sunrise, so as to be full days. For this purpose the fraction is left out or considered as full, according as the New Year begins in the daytime or night-time, To get the Kali days for any date, add to this the days gone in the year.
4. One purpose of giving this is to check the Kali days and correct it.

By verse (2a), the Kali years gone are 1869+3179= 5048. By (2b-3): 5048×365=18,42,520. 5048/4= 1262. 18,42,520 + 1262 = 18,43,782. 5048 × 5 = 25,240. Deducting from this 1237 and dividing by 576, we get days etc., 41-40-19. Adding this to 18,43,782, we have 18,43,823-40-19 as the Kali days gone to the beginning of the True year. The *Saṅkramaṇa* is at nāḍis 40-19 and it is night. So the Kali days to the end of the day is 18,43,824. To find the week-day, divide this out by 7. The remainder is 3. So counting from Friday, 3 days have gone, *i.e.*, Sunday has gone. The New Year's day is Monday.

The days gone from the beginning of the year to the end of the month of Siṁha is 156.[5] Adding this and 24 days gone in the month of Kanyā, we have 18,44,004, the Kali days to the end of the 24th Kanyā.

(The True Sun)

3b–4a, 4A. Divide the Kali days to the end of the True year by 7. The remainder is the *Dhruva,* to which should be added each of the mnemonics beginning with *Śrīrguṇamitra* given at the rate of a foot (of 5 letters) for each, to get the time and week-day of the succeeding Saṅkramaṇas, Ṛṣabha etc.

The mnemonics in days etc. are: 2-55-32; 6-19-44; 2-56-22; 6-24-34; 2-26-44; 4-54-6; 6-48-13; 1-18-37; 2-39-30; 4-6-46; 5-55-10; 1-15-31.

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5. There is a mnemonic for this :

kulīna	*vṛkṣajña*	*vidhāna*	*matrayā*
31	62	94	125
kṣaṇasya	*siṁhasya*	*suputra*	*catvaram* |
156	187	217	246
tathādri	*mīnāṅga*	*mṛgāṅga*	*mātulaḥ*
276	305	335	365
krameṇa	*yuktāni*	*kaler*	*dināni vai* ||

4b–5a. To get the True Sun, as a first approximation take the vināḍis, nāḍis and days elapsed from the Meṣa Saṅkramaṇa as the Sun etc. Deduct the minutes of arc corresponding to the vināḍis etc., (taking the minutes from the mnemonics *Bhūpajña* etc. which are given for 10, 20, 30, etc. days from Meṣa Saṅkramaṇa). The True Sun in degrees, minutes and seconds is got.

5A. The deductive minutes given by the mnemonics are:

(*1*) 14,	(*2*) 32,	(*3*) 54,	(*4*) 78,	(*5*) 105,
(*6*) 133,	(*7*) 163,	(*8*) 194,	(*9*) 224,	(*10*) 254,
(*11*) 284,	(*12*) 311,	(*13*) 335,	(*14*) 358,	(*15*) 376,
(*16*) 391,	(*17*) 403,	(*18*) 411,	(*19*) 415,	(*20*) 416,
(*21*) 412,	(*22*) 406,	(*23*) 398,	(*24*) 386,	(*25*) 374,
(*26*) 361,	(*27*) 347,	(*28*) 334,	(*29*) 322,	(*30*) 311,
(*31*) 303,	(*32*) 297,	(*33*) 295,	(*34*) 296,	(*35*) 301,
(*36*) 309,	(*37*) 322.			

5b. Deducting 0 from 32, 32 from 54 etc., get the intervals in minutes. Divide this by 10, and deduct from 60 minutes if the succeeding mnemonic is greater than the previous. If the succeeding is less add to 60 minutes. The daily True Motion in minutes is got, during the corresponding ten-day interval.

(The Method of Interpolation)

6-8. Interpolation to get values for intervening days etc., is to be done thus:[6] After whole mnemonic numbers have been taken, if the *last* of them and the *next* have the same sign, take their difference. If they have different signs, add them. Multiply this by the part left over and divide by the interval. Add the *result* if the *next* is greater numerically than the *last* and subtract if less, in the case of the *last* and the *next* having the same sign. If of different signs, take the difference between the *last* and the *result*, for the required value. If the *result* is less than the *last*, the value found has the same sign as the *last*; if greater, it has a different

6. This rule is general and should be used *mutatis mutandis* in every case where mnemonic tables are given.

sign. (All this can be put succinctly thus: If a is the *last*, b is the *next*, c is the interval and x is the part left over, $a+(b-a)\ x/c$ is the value wanted, having regard of the well-known rule of signs).

Example 2. (a) *Find the True Sun for Kali days 18,44,004.*

The Kali days at the moment of Meṣa Saṅkramaṇa are 18,43,823-40-19. Deducting this from 18,44,004, we get 180-19-41 days elapsed. The Approximate Sun = 180° 19′ 41″. For 180 days we have 180÷10=18 full mnemonics gone. The value for the 18th mnemonic is 411′=*last*. The *next* is 415′. The part left over is 0-19-41. As 411 and 415 have the same sign, we take their difference, 4′. 4′ x (0-19-41) days÷10 days gives 8″. This should be added to the *last*, i.e. 411′, as the next is greater. So we get 6° 51′ 8″. Deducting this from the Approximate Sun, as instructed, we have True Sun=173° 28′ 33″. The degrees being converted into Rāśis, we have 5^r 23° 28′ 33.″

Note. We can get the *Bhūpādi* correction also by using the above formula $a+(b-a)\ x/c$, *i.e.*, $411'+(415'-411')\times$ (0–19–41 days)÷10 days$=411'+8''=6°\ 51'\ 8''$.

(*b*) *Find the daily motion for date.*

The interval in minutes is 4, *i.e.*, 240″. Divided by 10, it is 24″. Deducting from 60′, as the *next* is greater, the daily motion is 59′ 36″.

(The True Moon)

9–11. Deduct 16,00,984 from the Kali days. Divide the remainder by 12,372. Divide the remainder after this division by 3031. Divide the remainder of this by 248. The remainder of this is the number of the mnemonics to be taken from the Moon's mnemonic-tables beginning with *Gīrnaḥ śreyaḥ*.[7] Multiply 9^r 27° 48′ 10″ by the first quotient, 11^r 7° 31′ 1″ by the second quotient,

7. This mnemonic-table is given as Appendix II above (see pp. 125-34). The values are in rāśis, degrees and minutes.

and 0^r 27° 44′ 6″ by the third quotient; add them up and add 7^r 2° 0′ 7″. This sum is the Moon's *Dhruva*. Add to this the value of the mnemonic from the table. The Uncorrected True Moon is got.

12-14a. Multiply the second quotient by 8 and deduct this from the third quotient multiplied by 32. The result are *plus-vināḍis*. If the third quotient is zero, the product of the second quotient by 8 alone should be taken and treated as *minus-vināḍis*. Deduct 13° 11′ from the True daily motion in degrees, and multiply the degrees etc., by the *plus* or *minus vināḍis*. The result are plus or minus seconds of arc etc., and these should be applied to the Uncorrected True Moon. If the True daily motion is less than 13° 11′, then the defect is to be multiplied by the *plus* or *minus vināḍis* and the resulting seconds should the taken as *minus* or *plus*-seconds respectively, and applied to the Uncorrected True Moon. The True Moon is got.

Example 3. *Find the True Moon for Kali day 18,44,004.*

18,44,004 –
16,00,984

			7^r	2°	0′	7″
12372) 2,43,020 (	19×9^r 27° 48′ 10″	=	8	18	15	10
3031) 7,952 (	2×11 7 31 1	=	10	15	2	2
248) 1,890 (	7× 0 27 44 6	=	6	14	8	42
	Dhruva	=	8	19	26	1
Mnemic No. 154.	Value for this No.	=	7	21	48	
Uncorrected True Moon		=	4	11	14	1

7×32 vināḍis minus 2×8 vināḍis = 208 *plus-vināḍis*. The daily motion for the Kali day ending 18,44,004 is got by deducting from the value for mnemonic 154, *viz*. 7^r 21° 48′, the value for the previous mnemonic, *viz*. 7^r 7° 36′. Thus we get 14° 12′ as the daily motion. Deducting 13° 11′ from this we have 1° 1′, *i.e.* $1\frac{1}{60}$°. The correction is: $1\frac{1}{60}\times$ 208 = 211 in seconds, and this is additive as the vināḍis are *plus vināḍis* and the daily motion is greater than 13° 11′. Adding this we get, True Moon = 4^r 11° 17′ 32″.

(Reduction to Local True Sunrise)[8]

14b–16a. Add up algebraically: (i) half the vināḍis of difference of day-time from 30 Nāḍis, these vināḍis being positive if the day-time is less, (*Cara*), (ii) the vināḍis of difference in sunrise due to difference in longitude, (*Deśāntara*), and (iii) the vināḍis of the part of the Equation of Time due to the Sun's Equation of the Centre, (*Bhujāntara*)[9]. Multiply the True daily motion of the Sun etc. in degrees by the vināḍis got, and take them as seconds etc. of arc. Add or subtract these seconds in the True Sun etc. according as the vināḍis got are positive or negative.

16A. The vināḍis of *Bhujāntara* for the times of the Sun at the ends of the Rāśis Meṣa etc. are respectively: +16, +7, –5, –15, –21, –21, –14, –6, +4, +14, +20, +21.

16b–17a. To find the *Deśāntara,* take the east-west distance of the place from the Ujjain longitude. in yojanas. Divide by 55. The Deśāntara in nāḍis is got. This is positive if the place is west of the Ujjain longitude and *vice versa.*

Note: *Cara* will be given in Ch. III.

Example 4. *Reduce to the True Sunrise of Pudukkottai on date ending 24th Kanyā: (a) the True Sun found in Ex. 2, and (b) the True Moon found in Ex. 3, taking the Cara of date at Pudukkottai as +26 vināḍis and its distance 24.4 yojanas east of the Ujjain longitude.*

Interpolating for the given date, the Bhujāntara got is –21 vināḍis, because for the end of Siṁha it is –21 and for the end of Kanyā, –21. Half Cara is $+26/2=+13$ vināḍis. The Desāntara is $24.4/55=0.443$ nāḍis = 26.6 vināḍis. This is –26.6 because the place is east of Ujjain as given. Adding algebraically, $-21+13-26.6=-34.6$ vināḍis.

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8. This should be applied to all celestial bodies, *viz.* the Sun, Moon, Rāhu and the Planets given in Ch. II.

9. Strictly speaking, the whole of the Equation of Time, including the part due to the Reduction to the Equator, should be used here. But Hindu astronomers before S'rīpati's time were not aware of this, and Bhāskara I has not given this. So this does not find a place in the present work also.

(a) The True Sun found in Ex. 2, is 5^r 23° 28′ 33″, and the daily motion, 59′ 36″. Multiplying by 34.6, the reduction got is 34″. Subtracting this, as the vināḍis are negative, the True Sun reduced to the True Sunrise of date and place is 5^r 23° 27′ 59″.

(b) The True Moon found in Ex. 3 is 4^r 11° 17′ 32″ and the Moon's daily motion of date is 14° 12′. Multiplying this by 34.6, the Reduction got is 491″, subtractive, as the vināḍis are negative. Subtracting, we get the Reduced True Moon, 4^r 11° 9′ 21″.

(Rāhu)

17b–19a. Deduct 16,00,066 from the Kali days. From the remainder deduct days etc. got by multiplying the remainder by 9 and dividing by 1,69,809 (? 1,69,804). Divide out the remaining days etc. by 6792 and take the remainder alone in days etc. The quotient got by dividing this by 566 are rāśis; the quotient of dividing by 566, what is left over multiplied by 30, gives degrees, the quotient of dividing by 566, what is still left over multiplied by 60, gives minutes, and so on. Deduct these rāśis etc. got from 12^r. Rāhu is obtained, (no distinction being made between True and Mean Rāhu).

Example 5. *Find Rāhu for the end of Kali days 18,44,004.*

Deducting 16,00,066, we get the remainder 2,43,938.

$$\frac{2{,}43{,}938 \times 9}{1{,}69{,}809} = 12 \text{ days, } 56 \text{ nāḍis approx.}$$

Deducting this from 2,43,938, the remaining days are 2,43,925 days 4 nāḍis. Divided out by 6792, the remainder of days etc. is 6205-4. Dividing 6205-4 by 566, the quotient got is 10, which are rāśis. Multiplying the left-over, 545-4 days etc., by 30, and dividing by 566, the quotient got is 28, which are degrees. The left-over is 504 etc. Multiplying this by 60 and dividing by 566, the quotient got is 53, which are minutes. 242 is left-over. This multiplied by 60 and divided by 566 gives the quotient 26, which are seconds. Thus we get 10^r 28° 53′ 26″. This deducted from 12^r gives Rāhu = 1^r 1° 6′ 34″.

(The True Sun etc. for any time of the day)

19b. (As computed for a whole number of Kali days) the Sun etc. got are for the end of the day, (*i.e.* for the beginning of the next day). From this they should be got for any time of the day by interpolation, using the respective daily motion.

Example 6. *Given the Sun at sunrise to be* 5 23° 27′ 59″, *and the Sun's daily motion,* +59′ 36″, *find the Sun at* 20 *nāḍis after sunrise.*

The motion for 20 nāḍis is, + 59′ 36″ × 20/60 = +19′ 52″. Adding, the Sun at 20 nāḍis is 5^r 23° 47′ 51″.

CHAPTER II

THE PLANETS

(The True Planet, given the Kali days)

1–2. From the Kali days for which the planet is desired, deduct the respective *Śodhya* given in the Tables. Divide the remainder by the respective *Maṇḍalas* (any *Maṇḍala* or *Maṇḍalas* may be used, and any number of times,) and note the quotients. Divide the remainder by the respective synodic cycle of days. The quotient are the cycles gone, and the remainder, the days in the next cycle. (i) Find the Total Dhruva in the manner to be given. (ii) using the mnemonics of that cycle, corrected in the manner to be given, take values for the maximum number of days that can be done. (iii) Find the motion for the remaining days by interpolation. Add i, ii and iii, (iii being deductive if the motion is found to be retrograde). The (unreduced) True Planet is got.

3–4. In each mnemonic line belonging to the tables giving the Śodhya and Maṇḍalas, the last three letters give the *Dhruva* in minutes, and the others, first the nāḍikās and then the days. In the case of Venus, and that too in the 4th Maṇḍala alone, the last 4 letters give the Dhruva. If the very last vowel is short, the Dhruva is negative, otherwise, positive. The same criterion of positive and negative applies

to the correction-letter occurring in the mnemonics in the cycle-tables. In the Śodhya etc. tables, the nāḍis and days given by the first mnemonic is Śodhya, the last is the cycle-days and the rest, the Maṇḍalas.

5–6a. (i) is given here. Take the Dhruvas of the Maṇḍalas used for division, and multiply by the respective quotients. Add these and the Dhruva of the Śodhya, algebraically, having regard to the signs and find the total with its sign. This is the total Dhruva to be used as (i) above.

6b–9. This gives (ii). In the mnemonic-lines of the cycle-tables, in those of Mercury, Jupiter and Saturn, the last is the correction-letter. In those of Mars, the last two letters are the correction letters. In those of Venus, the last two letters are correction-letters, but each letter is a different correction, the first to be used if the total Dhruva is positive, and the second to be used if the total Dhruva is negative. With regard to the correction-letter of Venus, another point is to be noted: If the letter is one of the nine letters beginning from ṭa, the number indicated is to be reduced by half. Incidentally it may be noted that all numbers used in this work, *viz. the Vākyakaraṇa,* are given in the *Kaṭapayādi* notation. The Dhruva in degrees etc. multiplied by the correction-number gives the correction in minutes etc. This correction is positive if both the multiplier and the multiplicand have the same sign, and negative otherwise, and this is to be added or subtracted respectively in the value given by the mnemonic line, and thus the correction is made for the sake of (ii).

10–11. (iii) is done thus: Take the corrected value of the mnemonic used, and the next corrected value. Find their difference, and divide by the interval in days. This is the daily motion, which is retrograde if the next value is less. The daily motion, multiplied by the days etc. remaining, is the motion for those remaining days etc., to be used as (iii). (The mnemonic of the last day of a cycle is that of the 0 day of the next cycle. The mnemonic of the 0 day of the first cycle is the respective Apogee, *viz.* 118° for Mars, 210° for Mercury, 180° for Jupiter, 90° for Venus and 236° for Saturn. These are to be corrected using the correction-letter of the last mnemonic of the last cycle of the

respective planet.)[10] If the True planet or daily motion is required for a day which is less than the days pertaining to the first mnemonic of any cycle, the ideas within brackets are to be used in the calculation.[11]

Example 7. *Compute the True Longitude of Mars for Kalidays 18, 44, 004 ending.*

	Days	Dhruva
	18,44,004-00	
S'odhya	15,52.827-35	—402′
1,32,589-21)	2,91,176-25 (2× +27	+ 54′
17,158-37)	25,997-43 (1×−504	—504′
780)	8,839- 6 (11	Total :—852′ = —14° 12′ (i)
	259- 6	

11 cycles have gone and we must compute for 259-6 days in the 12th cycle. From the tables we see in the 12th cycle that out of 259-6, the maximum that can be taken is for 250 days, *viz.* $3^r\ 18^\circ\ 18' - 9$ (cor.)
The next is for 270 days, ,, $3^r\ 28^\circ\ 35' - 12$,,

The correction is $-9 \times (-14^\circ\ 12'$, taken as minutes etc.)
$= 9 \times 14'\ 12'' = +2^\circ\ 7'\ 48''$

$3^r\ 18^\circ\ 18' + 2^\circ\ 7'\ 48'' = 3^r\ 20^\circ\ 25'\ 48''$ (ii)

The correction for $3^r\ 28^\circ\ 35'$ is $-12 \times -14'\ 12'' = +2^\circ 50'\ 24''$.

$3^r\ 28^\circ\ 35' + 2^\circ\ 50'\ 24'' = 4^r\ 1^\circ\ 25'\ 24''$

The motion for 270—250, *i.e.* 20 days =
$(4^r\ 1^\circ\ 25'\ 24'')-(3^r\ 20^\circ\ 25'\ 48'') = 10^\circ\ 59'\ 36''$

The motion per day, *i.e.* daily motion $= 10^\circ\ 59'\ 36'' \div 20$
$= 32'\ 58''.8$

The motion for 9 days and 6 nāḍis $= 9\frac{1}{10} \times 32'\ 58''.8$
$= 5^\circ\ 0'\ 7''$ (iii)

Adding alegebraically, True Mars $= 25'\ 48'' + 5^\circ\ 0'\ 7''$
$-14^\circ\ 12' + 3^r\ 20^\circ$ $= 3^r\ 11^\circ\ 13'\ 55''$

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10. These ideas are not expressly stated by the author, but implied in his instructions, and are necessary.

11. In the instructions given in verses 1 to 11, some are for interpreting the mnemonic lines which consist of words, and converting them into numbers. Once these instructions are carried out and the tables are given in numbers, we may forget these instructions, and give our attention to the remaining instructions which give the methods of computation. In the examples given below, such prepared tables are presupposed. The mnemonic tables are given as Appendix III: कुजादि-पञ्चग्रहवाक्यानि (see above pp. 135-249).

Example 8. *Compute the True Venus for Kali days 18,44,004 ending.*

	Days		Dhruva
	18,44,004-00		
	15,61,937-44		+ 17′
1,74,594- 8)	2,82,066-16	(1× + 29′	+ 29′
88,756-53)	1,07,472- 8	(1× — 58′	− 58′
2,919-38)	18,715-15	(6× —144′	−864′
584)	1,197-27	(2	Total Dhruva = −876′ =
	29-27		—14° 36′

Two cycles have gone, and we must compute for days 29–27 in the 3rd cycle. There is no mnemonic for less than 40 days in the third cycle and so the last mnemonic value of the second cycle is to be taken as that for Zero day of the third. This is 5^r 10° 24′ (cor.) 0, 0. The next, for 40 days is: 7^r 0° 10′ (cor.) 0, 0. As the Dhruva is negative, the second corrector is to be used. But here they are 0 in both mnemonics. So the True motion at Zero day is 5^r 10° 24′.

The motion for 40 days $= 7^r\ 0°\ 10' - 5^r\ 10°\ 24' = 1^r\ 19°\ 46'$

The daily motion $= 1^r\ 19°\ 46' \div 40 = 1°\ 14'\ 39''$

The motion for 29 days 27 nāḍis $= 29\frac{27}{60} \times 1°\ 14'\ 39'' = 1^r\ 6°\ 38'\ 27''$

Adding, True Venus $= -14°\ 36' + 5^r\ 10°\ 24' + 1^r\ 6°\ 38'\ 27''$
$= 6^r\ 2°\ 26'\ 27''$

(**Tips for convenience**)

12. Take any number of the Kali days gone, for computation, and do the work as usual. Take the remainder after the Maṇḍalas have been used. Deduct it from the Kali days taken. This may be used as the Śodhya in the place of the original Śodhya given, for all future work. But when this Śodhya is used the original Śodhya-Dhruva should be discarded and the Total Dhruva obtained in the above work should be taken as the Śodhya-Dhruva.

Example 9. *Find a new Śodhya and Śodhya-Dhruva for Mars, using Kali days 18,48,500.*

	Days	Dhruva
	18,48,500-00	
	15,52,827-35	—402′
1,32,589-21)	2,95,672-25 (2 × + 27 =	+ 54′
28,857-41)	30,493-43 (1 × + 133 =	+ 133′
	1,636- 2 Total Dhruva	— 215′

Deduct days remaining after the Maṇḍala division, 1,636-2, from 18,48,500. The remainder, 18,46,863-58, is the new Śodhya, and —215′ is its Dhruva.

(The Time when a Planet has a desired True Longitude)

13–15a. (To find the time when a planet has a desired True Longitude, the method is as follows :) Take the Kali days of the Meṣa Saṅkramaṇa of the year in or after which the longitude is desired. Doing the usual work, find the Total Dhruva and the days etc. remaining after division by the cycle-days. These remaining days are called *Varṣādi-śeṣa* (VS). Add or deduct the Dhruva in the desired planet according as the Dhruva is negative or positive and call it DP. Among the corrected mnemonic values following in that cycle or the following cycles, find the immediate one equal to or close to DP. If a value equal is got, mark the day in the cycle for which it is given. If only a value close to DP is got, find their difference in minutes and divide by the daily motion in minutes. Days etc. are got. If the value is greater than DP deduct the days obtained from the day for which the value is given, if less add. But in the case of the daily motion being retrograde, the addition and subtraction should be interchanged. Thus the days in the cycle at which the desired true longitude occurs is got.

15b–17a. Add the days of as many cycles as there are changes of cycles to these days got. Deduct the VS. The remainder are the days form the beginning of the year taken for work till the occurrence. Divide these days by the duration of the year, *viz.* 365-15-31. The quotient are whole years. Add

these to the Śaka year taken for work. After so many Śaka years have gone, the remainder are the days of the occurrence in the Śaka year next.

Example. 10. *After Śaka 1869 gone, when will Saturn enter the asterismal segment Uttara Phalgunī?*

From Ex. 1, for S'aka 1869 gone, the Kali days are 18,43,823-40-19. Doing the work for Saturn as in Ex. 7:

	Days		Dhruva
	18,43,823-40-19		
	15,89,474-28		$-326'$
1,82,994-23)	2,54,349-12-19	(1 × −13	$-13'$
21,551-0)	71,354-49-19	(3 × +43	$+129'$
378)	6,701-49-19	(17 cycles gone.	$-210'$ = Total Dhruva
	275-49-19 = Varṣādi-seṣa (VS) in the 18th cycle.		

The True Longitude of Saturn wanted is the beginning of the Uttara Phalgunī, *i.e.* $11 \times 13° \ 20' = 146° 40' = 4^r \ 26° \ 40'$.

Applying the Total Dhruva with the sign changed, $4^r \ 26° \ 40' + 210' = 4^r \ 26° \ 40' + 3° \ 30' = 5^r \ 0° \ 10' = DP$. Examining the succeeding cycles for mnemonic value close to this DP, we get for 378 days in the 21st cycle, *i. e.* Zero day in the 22nd cycle, $4^r \ 29° \ 44'$, cor. + 1. The correction is $1 \times -210'/60 = -3' \ 30''$. The corrected mnemonic is $4^r \ 29° \ 40' \ 30''$. The longitude wanted is greater. So going to the next mnemonic, *i.e.* for 30 days in the 22nd cycle, it is 5r 3° 30′, cor.—1. The corrected mnemonic is $5^r \ 3° \ 33' \ 30''$. For 30 days the motion is $5^r \ 3° \ 33' \ 30'' - 4^r \ 29° \ 40' \ 30'' = 233'$, and the daily motion $= 233'/30 = 7' \ 46''$. The given longitude is more than $4^r \ 29° \ 40' \ 30''$ by $29' \ 30''$. To make up this the days required $= 29' \ 30'' \div 7' \ 46'' = 3$ days, 47 nāḍis, 54 vināḍis. Thus we get the required True Longitude of Saturn at 3 days, 47 nāḍis and 54 vināḍis in the 22nd cycle.

From the 18th to the 22nd there are 4 cycle transitions. So add $4 \times 378 = 1512$ days, and we have 1515-47-54 days etc. Deducting the VS, we get 1515-47-54—275-49-19 = 1239-58-35 days etc. after the elapsing of which from the Śaka 1869 gone, the required longitude occurs. Dividing by 365-15-31, we get 3 years, and 144-12-2 days etc. Add the years to the Śaka taken. Thus when Śaka 1872 has gone, in the succeeding year—(Note that the name of this succeeding year is Śaka 1872)—at 144-12-2 days etc. from Meṣa Saṅkramaṇa, Saturn enters Uttara Phalgunī.[12]

Example. 11. *Find the time when Jupiter will enter Dhanū Raśi, after 1873 Śaka expired.*[13]

The Kali days for Śaka 1873 expired are 18,45,284-42-24. From this, following the previous example, the Total Dhruva got is —14° 58′, and the VS got is days 26-57-24 in the 6th cycle.

The true longitude wanted is 8 Raśis. Applying the Total Dhruva with the sign changed, the DP = 8^r 14° 58′. This value or anything near does not occur in the succeeding days of the 6th cycle or in the succeeding cycles. It occurs in a previous cycle, *i. e.* the 3rd. So there is a change of Maṇḍala. Adding to the Total Dhruva, the Dhruva of the last Maṇḍala, +274′, we have the new Total Dhruva, -10° 24′. Using this, we have the new DP, 8^r 10° 24′.

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12. It is obvious that it is this type of problem that occurs in *Pādacāra.*

13. This is a type of problem in which the required planet will not occur in the following days of the cycle or succeeding cycles, but in a previous cycle. What should be done in this case, though implicit, is not expressly mentioned in the Text. Here add the Dhruva of the last Maṇḍala to the Total Dhruva and use this to find the DP. As usual. find the days etc. in the cycle when the longitude occurs. Add to these days, the days of the cycles that have gone from the beginning. To this add the days etc. of the last Maṇḍala. From this deduct, not the VS, but the last remainder after dividing by the Maṇḍalas in the preliminary work. These are the days to be divided by 365-15.31 etc.

The mnemonic for 30 days in the 3rd cycle is 8^r 8° 37′, cor. —2. For 60 days it is 8^r 14° 20′, cor. —2. From this the days got in the cycle for the required DP is 37-32-22. Adding 798 days for the two cycles gone from the beginning, we get 835-32-22. Adding the days of the last Maṇḍala, 4387-44, we have 5223-16-22. In the preliminary work, the last remainder after dividing by the Maṇḍalas is 2021-57-24. Deducting this, we have, days 3201-18-58, passed from the taken Śaka. Converted into years, it is 8 years, 279-14-48 days. Adding to the Śaka taken, 1873 expired, the required time is 279-14-48 days after Śaka 1881 expired.

(The Detection of errors in the Mnemonics relating to the Śodhya Tables)

18b–20. When there is a doubt about any of the days etc. given for the Śodhyas and the Maṇḍalas, find the mean longitude and the longitude of the Śīghra of the planet according to the *Bhāskarīya*[14] for the days doubted. If these longitudes are found to be equal, and not far from the Apogee for Śodhyas, and 0 or 12 Raśis for the maṇḍalas, then the days given are alright. The difference between the common longitude and the Apogee in minutes is the Dhruva. If the common longitude is greater than the Apogee it is positive, and *vice versa*.

Example 12. *Verify Jupiter's Śodhya, 15,70,425-17, and the related Dhruva, —261′.*

Taking the given days as Kali days, if we compute the Śīghra of Jupiter, *i.e.* the Mean Sun, we get 5^r 25° 39′. For the same time the Mean Jupiter by the corrected *Bhāskarīya* is 5^r 25° 39′. These being equal, and very near Jupiter's Perigee, *viz.* 6^r 0° 0′, the day is correct. 5^r 25° 39′ is 261′ less than the Perigee. So the Dhruva, —261′, is also correct.

14. The *Bhāskarīya* corrected by *Vāgbhava* correction and another correction by the author is to be used here.

Example 13. *Verify Mercury's Maṇḍala and Dhruva, 2549-15 and —447'.*

For 2549-15 days the Sun's motion is 11^r 22° 32′ 52″ which is the same as Mercury's Mean, and Mercury's Śighra is 11^r 22° 32′ 2″. After 16 vināḍis, *i.e.* for 2549-15-16, they will be equal, *viz.* 11^r 22° 33′. As the days are given correct to nāḍis, 2549-15 is alright. 11^r 22° 33, is 447′ less than 0 or 12^r, and so the Dhruva, —447′, is also correct.

(The Detection of errors in the Mnemonics in the cycles)

21-25. Add to the days of the mnemonic in doubt the days of all the cycles gone. For these days find, using Haridatta's method [15], the Mean and Śighra motions of the planet, and add to each the longitude of the Apogee. Using these compute the True Planet. This is the mnemonic value. To find the Corrector: Add one degree to each of the Mean and the Śighra used for computation in the above work, and using them do the computation again and deduct one degree from it. Find the difference of this and the previous computation. This is the Corrector for the mnemonic in the case of all planets except Venus. For Venus the Corrector is to be found thus: Instead of one degree add 36°, and do the computation; deduct 36° and find the difference. Divide this by 36. This gives the Corrector for Positive Dhruva. For Negative Dhruva, instead of adding 36° each, deduct, and do the computation and add 36°. Find the difference. Divide this by 36. In all cases if the Kendra of the penultimate operation is from 3^r to 9^r, the Corrector is positive; if from 9^r to 3^r, it is negative.

Example 14a. *Verify the 400 days mnemonic in the 8th cycle of Mars.*

Here 7 cycles have gone and 400 days have gone in the 8th, *i.e.* $7 \times 780 + 400 = 5840$, for which the mean

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15. The author intends us to use Haridatta's *Parahita* with the *Vāgbhava* correction (See *Grahacāranibandhana* of Haridatta, Madras, 1954, Intro. pp. ix-x). He does not want that the additional correction on the *Bhāskarīya*, which is perhaps his own, to be used, the periods being comparatively short.

motion of Mars is 6^r 10° 48′, For the same period the Śīghra of Mars, *i. e.* the Mean Sun = 0^r 15° 38′. Adding the Apogee of Mars, 3^r 28°, we have Mean Mars = 10^r 8° 48′, Mars's Śighra = 4^r 13° 38′. Wit these, and using Haridatta's Parahita Tables, the True Mars = 10 3° 47′. This is the mnemonic value wanted. (Actually we find 10^r 3° 48′ given in the tables, and the difference of 1′ is reasonable.)

Now for the Corrector: Adding one degree each, we have Mean Mars = 10^r 9° 48′, and Śighra = 4^r 14° 38′. Working with these we get True Mars = 10 5° 25′. Deducting 1 degree from this we have 10 4° 25′. The difference between this and the mnemonic determined is 38′. The Kendra of the penultimate operation is 6 8° 6′ and so falls between 3 and 9. So this is positive, *i. e.* the Corrector is +38′.

Example 14b. *Determine the Corrector for Negative Dhruva for Zero day in the first cycle of Venus.*

The total day is 0. The Śīghra and Mean are 0. Adding the Apogee to each we get the Śighra and Mean each equal to 3 0° 0′. Working according to Haridatta's *Parahita*, the True Venus for 0 day in the first cycle is 3^r 0° 0′, as implied by the author. To find the Corrector of the Negative Dhruva, deducting 36° from the Śīghra and Mean Venus, we have 1^r 24° 0′ each. We get the True Venus, 1^r 24° 41′.3 for this. Adding 36° we get 3^r 0° 41′.3. The difference between this and the True Venus for 0 day, 3 0° 0′ already found, is 41′.3. As the Kendra used for penultimate work is 10^r 24° 0′, and therefore between 9^r and 3^r, this is negative, *i.e.* —41′.3. Dividing by 36, we get the corrector,—1′.1, for Negative Dhruva.

CHAPTER III

PROBLEMS INVOLVING TIME, POSITION AND DIRECTION

(The Precession of the Equinoxes)

1. Deduct 3600 from the Kali years gone, deduct from it the 121-th part of itself and divide by 60. The Total Precession is got in degrees etc. If the precession got is more than 24°, deduct it from 48° to get the Precession.[16]

2a. In computing the *Cara* (Declinational Ascensional Difference, *i.e.* difference between day-time and 30 nāḍis), the Declination, the Shadow, the Mahāpāta etc., the Sun, Moon and Planets should be used after adding the Precession to them.

Example 15. *Find the Precession for 5048 Kali expired.*

5048—3600 = 1448. Deducting 1/121 of this, *i.e.* 12, we have 1436. Dividing by 60, the Precession obtained is 23° 56′.

Example 16. *Find the Precession for 5060 Kali gone.*

Deducting 3600, and subtracting the 121th part, we have 1448. Dividing by 60, we have 24° 8′. This is greater than 24°. So deducting from 48°, the Precession got is 23° 52′.

(Sine etc. and Arc)

2b–4. For every increase of 15° of arc from 0, we have the Sine segments 11, $10\frac{1}{2}$, 9, 7, 4 and $1\frac{1}{2}$, in degrees.[17] To find the sine of any arc, take as many sine-segments as there are full 15° in the arc. Add to these the fraction of the sine-segment got from multiplying the sine-interval by the degrees left over, and dividing by 15. To find the arc of any sine, deduct from it as many sine-segments as can be done and multiply the number

16. The instruction to deduct from 48° is based on the oscillation theory propounded by most of our ancient astronomers, and is wrong.

17. To give the sines in degrees may appear strange to a moderner ; but the ancients gave them generally in minutes etc. (here degrees etc.) for the sake of convenience.

by 15°. Add to this the degrees got by multiplying the sine left over by 15°, and dividing by the sine-segment next to the last full sine-segment taken.

5. The part of the arc falling into the quadrant containing the rāśis 0 to 3, *i.e.* the first quadrant, is called *Bhujā*. That falling into the quadrant containing rāśis 3+ to 6, *i.e.* the second quadrant, is called *Koṭī*. That falling into the quadrant containing rāśis 6+ to 9, *i.e.* the third quadrant, is called *Bhujā*. And that falling into the quadrant containing rāśis 9+ to 12, *i.e.* the fourth quadrant, is called *Koṭī*; the rāśis etc. of Bhujā, deducted from 3^r is called *Koṭī*; the rāśis etc. of Koṭī deducted from 3^r is called *Bhujā*.

Example 17a. *Find the sine for the arc 1^r 5°.*

1^r 5° = 35°. For the two 15° that can be taken, there is $11 + 10\frac{1}{2}$. For the 5° left over, there is $5 \times 9 \div 15 = 3$. Adding these, the Sine is $24\frac{1}{2}$.

Example 17b. *Find the arc for the sine $39\frac{1}{2}$.*

From this four sine-intervals can be taken and 2 is left over. So the corresponding Arc = $4 \times 15° + 2 \times 15 \div 4 = 67° 30'$, *i.e.* 2^r 7° 30′.

Example 18. *Given the arc 10^r 7° 30′, find its Bhujā and Koṭī.*

Now 10^r etc. extends into the fourth quadrant, and the part here gone into it is 1^r 7° 30′. As the quadrant is the fourth, this is *Koṭī*. Deducting from 3^r, 1^r 22° 30′ is the *Bhujā*, *i.e.* the *Bhujā* of the arc 10^r 7° 30′ is 1^r 22° 30′, and its *Koṭī* is 1^r 7° 30′.

(The Latitude of a Place)

6. Multiply the Equinoctial Shadow by 43, divide by the Equinoctial Hypotenuse and find its arc. This is the Latitude and it is always South[18] (and positive).

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18. The present Text envisages only places north of the Equator, and hence the statement 'always.' Calling it South is only a convention.

Example 19. *At Pudukkottai the Equinoctial Shadow is found to be 2 aṅgulas and 12 vyaṅgulas. Find the Latitude of Pudukkottai.*

2 aṅgualas and 12 vyaṅgulas = $2\frac{12}{60}$ aṅg. = 2.2 aṅg. The Equinoctial Hypotenuse = $\sqrt{2.2^2 + 12^2}$ = 12.2 aṅg. Now $2.2 \times 43 \div 12.2 = 7\frac{46}{61}$. The arc for this 10° 34′. So the Latitude of Pudukkottai is 10° 34′ (actually it is 10° 24′), and by convention followed by this Text, South.

(Cara : Declinational Ascensional Difference)

7. For each rāśi of the Bhujā of the True Sun, there are the numbers, 20, 16 and $6\frac{2}{3}$, respectively. These multiplied by the Equinoctial Shadow, give the respective Cara-intervals in vināḍis. If the Sun is from 6^r to 12^r the Cara is positive, and if from 0^r to 6r, it is negative.

Example 20. *Given the Sun's True Longitude, 3^r 29°, and the Precession 23° 30′, find the Cara for a place having 3 aṅg. Equinoctial Shadow.*

The Sāyana Longitude is 3^r 29°+23° 30′ = 4^r 22° 30′. Here 1^r 22° 30′ has gone in the second quadrant, and so it is Koṭī. The Bhujā, therefore, is 3^r *minus* 1^r 22° 30′ = 1^r 7° 30′. For the first rāśi, the Cara-interval is $20 \times 3 = 60$ vināḍis. For the second it is $16 \times 3 = 48$ vināḍis. For 1 7° 30′, the Cara-vināḍis are $60 + 48 \times 7° 30' \div 30 = 60 + 12 = 72$; and this is minus because the Sāyana Longitude is within 0 to 6^r.

(Day-light)

8. The Cara-vināḍis with its sign reversed and applied to 30 nāḍikās is the Day-time. The Day-time deducted from 60 nāḍikās is the Night-time. The Middle of each is Mid-day and Mid-night respectively.

Example 21. *Given the Cara-vinādis, -72, find the Day-time etc.*

The Day-time = 30 nāḍis— (-72) vināḍis = 31 nāḍis 12 vināḍis. The Night-time = 60 nāḍis — 31-12 = 28 nāḍis 48 vināḍis. The Mid-day is at 15-36 nāḍis after sunrise, and Mid-night at 14-24 nāḍis after sunset.

(Rasimana: The Total Ascensional Difference)

9-10a. The Right Ascensional Differences for the three rāśis (sāyana), Meṣa etc., are 278, 299 and 323 vināḍis respectively. Take half the Cara in the given order and deduct them for the first 3 rāśis, *i.e.* Meṣa, Ṛṣabha and Mithuna; add taking them both in the reverse order to Kaṭaka, Siṁha and Kanyā; add taking them both in the given order to Tulā, Vṛścika and Dhanus; and deduct taking them both in the reverse order from Makara, Kumbha and Mīna.

Example 22. *Taking the Cara intervals to be 44, 36 and 14 vinādis, find the Sāyana Rāśimāna of the 12 rāśis.*

The twelve Rāśimānas are respectively: 278 — 22, 299—18, 323—7; 323+7, 299+18, 278+22; 278+22, 299+18, 323+7; 323-7; 299-18 and 278—22 vināḍis, *i.e.* 256, 281, 316, 330, 317, 300, 300, 317, 330, 316, 281, and 256 vināḍis.

(Lagna: The Orient Ecliptic Point)

10b-13. Take the time of the day for which the Lagna is wanted. Find the Sāyana Sun for that time. (i). Take the degrees etc. for the Sun to complete that Rāśi, multiply by that Rāśimāna and divide by 30. Deduct the vināḍis got from the given time, and take that Rāśi as gone; (ii). Next deduct as many full rāśimāna as can be done, and take those Rāśis as gone; (iii). Multiply the remaining vināḍis by 30 and divide by the next rāśimāna. Degrees etc. are got. These degrees etc. in that Rāśi is the Sāyana Lagna. Deduct the Precession, the Nirayana Lagna or *Lagna* is got.

14-15a. If the given time is so small that the vināḍis got in (i) cannot be deducted, multiply the given vināḍis by 30 and

divide by that Rāśimāna. Add the degrees etc. got to the Sāyana Sun found. This is the Sāyana Lagna. Deduct Precession. The Nirayana *Lagna* is got.

15b–16a. If *Lagna* is wanted for any time after sunset, the following alternative method can be used. Add 6 rāśis to the Sun and use that as the Sun, and use the nāḍis etc. after sunset upto the moment for which Lagna is wanted as the given time.

Example 23. *Find the Lagna at 47 nāḍis from sunrise, given the Sun at sunrise is 178° 28′, the Sun's Daily motion is 59′.6, the Precession is 23° 56′.5, and using the Cara and Total Ascensional Differences of Ex. 22.*

Using the Daily motion, the motion for 47 nāḍis is 46′.7. Adding, the Sun at 47 nāḍis is 179° 14′.7. Adding the Precession, the Sāyana Sun then is 203° 11′.2 = 6^r 23° 11′.2. The degrees etc. to complete the 7th rāśi is 6° 48′.8. Multiplying this by the rāśimāna of the 7th rāśi, *viz.* 300 vināḍis, and dividing by 30, we have 68 vināḍis. Deducting this from 47 nāḍis (or 2820 vināḍis) we have 2752 remaining (and 7 rāśis gone). Deducting the differences for the 8th, 9th, 10th, 11th, 12th, 1st, 2nd, 3rd and 4th, *i.e.* Kaṭaka, 69 vināḍis are left over in Siṁha. $69 \times 30 \div 317$ (the māna of Siṁha), we get 6° 31′.8 in Siṁha, as the Sāyana Lagna. Deducting the Precession 23° 56′.5, the Nirayana Lagna (*i.e. Lagna*) is 3^r 12° 35′.3.

Let us now use the alternative method, as 47 nāḍis, the time for which the Lagna is wanted, is past sunset. The Cara for date is 34 vināḍis and the daytime lasts 29-26 nāḍis. The given nāḍis are 17-34 nāḍis or 1054 vināḍis after sunset. We have already found the Sāyana Sun at 47 vināḍis on that day to be 6^r 23° 11.2. Adding 6 rāśis, we have 0^r 23° 11′.2, as the Sun to be used in this method. The Sun has 6° 48′.8 to go in Meṣa. Multiplying this by the Rāśimāna of Meṣa, *i.e.* 256 vināḍis, and dividing by 30°, we get 58. Deducting this from

1054, we have 996 vināḍis, and Meṣa gone. Then deducting the differences of the 2nd, 3rd and 4th Rāśis, we have 69 vināḍis left over, gone in Siṁha, the same as obtained according to the first method, the *Lagna* got from this being $3^r\ 12^\circ\ 35'.3$.

Example 24. *Using the data given in Ex. 23, find the Lagna at 1 nāḍi after sunrise.*

The Sun at 1 nāḍi is $178^\circ\ 29'$. The Sāyana Sun is $202^\circ\ 25'.5 = 6^r\ 22^\circ\ 25'.5$. The time for the Rāśi to be completed is $7^\circ\ 34'.5 \times 300 \div 30^\circ = 76$ vināḍis. This cannot be deducted from 1 nāḍi, the time given. So Multiplying the vināḍis of the given time, 60, by 30° and dividing by the Rāśimāna, 300, we get 6°, further gone in 1 nāḍi. Adding to the Sāyana Sun, we get Sāyana Lagna as $6^r\ 28^\circ\ 25'.5$. Deducting the Precession, the Lagna = $6^r\ 4^\circ\ 29'$.

(The Time for a given Lagna)

16b–19. Add the Precession to the Sun and the Lagna. Take the degrees of the Lagna gone, and of the Sun to go, in their Rāśis. Multiply the degrees by the Rāśimāna, divide by 30, and add them and the Rāśimāna of all the Rāśis between the Sun and the Lagna. This is the approximate time for the given Lagna. If the Lagna and the Sun are in the same Rāśi, deduct one from the other, multiply by the Rāśimāna and divide by 30. If the Lagna is greater, this is the Approximate time. If the Sun is greater, this deducted from 60 nāḍikās is the Approximate Time. Using the Sun of this time repeat the work, and the Correct Time is got.[19]

Example 25. *Given the Sāyana Lagna $8^r\ 15^\circ$, the Sāyana Sun $5^r\ 20^\circ$ and the Sun's Daily motion $58'.5$, find the Time of the Lagna.*

As per data the Lagna has gone 15° in the 9th Rāśi. So we have $15^\circ \times 330 \div 30 = 165$ vināḍis. The

19. Instead of repeating the work, we may deduct one vināḍi for every 6 nāḍis of the Approximate Time got, to get the Correct Time.

Sun has 10° to go in the 6th Rāśi. So we have $10 \times 300 \div 30 = 100$ vināḍis. Between the Sun and the Lagna there are 7th and 8th Rāśis for which we have 300 and 317 vināḍis. Adding all up we have 882 vināḍis, *i.e.* 14-42 nāḍis gone at Lagna. For this time the Sun is 5^r 20° 14′.3. Using this if we repeat the part of the work involving the Sun alone, we get 98 vināḍis instead of 100. So lessening 2 vināḍis in the total, we have 14-40 nāḍis.

Example 26. *Given the Sāyana Sun 5^r 20° and the Sāyana Lagna 5^r 25°, find the Time, the Sun's Daily motion being 58′.5.*

Lagna *minus* Sun $= 5^r\ 25° - 5^r\ 20° = 5°$. $5 \times 300 \div 30 = 50$ vināḍis is the time gone at the Lagna, as the Lagna is greater. Using the Sun of this time and repeating the work, practially the same Time is got.

Example 27. *Find the Time, given the Sun 5^r 18° and Lagna 5^r 15°.*

The Difference between the Sun and Lagna = 3°. $3° \times 300 \div 30 = 30$ vināḍis. As the Lagna is less than the Sun, deduct this from 60 nāḍis. The Time got is 59–30 nāḍis from the previous day's sunrise.

(Declination)

19A–20. For 5°, 10°, 15° etc. upto 90° of the Bhujā of Sāyana Longitude, the Declinations are: (i) 122′, (ii) 242′, (iii) 362′, (iv) 478′, (v) 593′, (vi) 704′, (vii) 809′, (viii) 907′, (ix) 1002′, (x) 1088′, (xi) 1167′, (xii) 1237′, (xiii) 1298′, (xiv) 1348′, (xv) 1388′, (xvi) 1416′, (xvii) 1434′, (xviii) 1440′. The Declination is to be found according to the Bhujā of the Sāyana Longitude. It is to be taken as negative (North) if the Sāyana Longitude is within 0 to 6 rāśis, and positive (South) if within 6 to 12 rāśis.[20] Add the Celestial Latitude (of the Moon) to this, if both have the same sign. Deduct one from the other and take the sign of the greater, if of different signs. The True Declination (of the Moon)[21] is got.

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20. This is the convention followed in this Text.

21. This Text gives latitude only for the Moon.

Example 28. *The Sāyana Longitude of the Moon is 3 10° and its Latitude 4° North, i.e. –4° according to the convention adopted by this Text. Find the Declination of the Moon.*

10° being gone in the second quadrant, it is Koṭi, and 3 *minus* 10°, *i.e.* 2^r 20° is the Bhujā. The Declination from the table for 2^r 20°, *i.e.* 80°, is — 1416′, (negative, because the longitude is between 0 and 6 rāśis). The Latitude of the Moon is — 4°, and as both have the same sign, adding we get the True Declination = –27° 36′ (*i.e.* North).

(The Mid-day Shadow)

21-22a. Add the Sun's Declination and the Latitude of the place, if they are of the same direction (or sign); deduct one from the other if they have different directions (or signs). Find its Sine, and also the Conversine (i.e. the combination of the segments taken in the reverse order). Multiply the Sine by 12 and divide by 43 *minus* Coversine, (*i.e.* by the Cosine). The Mid-day Gnomonic Shadow is got.

Example 29. *The Sun's Declination given is 23° 15′ North. The Latitude of Pudukkottai is 10° 23′ South. Find the Mid-day Shadow.*

Because of different directions, deducting one from the other, we get 12° 52′. Its sine is $11 \times 12°\ 52' \div 15° = 9.4.$. Its coversine is 1.3. The Midday Shadow $= 12 \times 9.4 \div (43 - 1.3) = 2.7$ aṅgulas.

(The Shadow at Any Time)

22b. Take half the Cara and (convert it into degrees at the rate of 1° per 10 vināḍis, and) find its Sine. Add this to 43 if the Sāyana Sun is within 0 to 6 rāśis; deduct it from 43 if the within 6 to 12 rāśis. This is called '*Antyā*'.

23. The interval in nāḍis between any desired Time and Mid-day is called '*Nata-nāḍi*'. Multiply this by 6 to get the '*Nata*-degrees',

24–25a. For the given Time of the day, find the Nata degrees and its Coversine. Find the hypotenuse related to the Mid-day Shadow. This hypotenuse *plus* $\{$(Nata-coversine × hypotenus) ÷ (Antyā—Nata-coversine)$\}$ is the hypotenuse related to the shadow at the given time. Square this hypotenuse got, deduct 144, and extract its square root. This is the Shadow of the Gnomon in aṅgulas at the given Time.

25b–26a. Multiply the Shadow in aṅgulas by 8, add $7\frac{1}{2}$, and divide by 15. The quotient are the measure of the human-shadow measured by the human foot, and the remainder are aṅgulas.

Example 30. *On a day when the Sāyana Sun is 60°, at a place having the Equinoctial Shadow of 8 aṅg., find a man's shadow measured by his foot, at a time 10 nāḍis after mid-day.*

(i) The Sun's Declination is 21° 13′, for the Longitude 60°. For Equinoctial Shadow 8 aṅg., the Latitude of the place is 33° 41′. From these the Mid-day Shadow is 2.65 aṅg. The hypotenuse related to this shadow is $\sqrt{2.65^2+144}=12.29$. (ii) The Cara-vināḍis are $36\times8=288$. Half Cara is 144 vināḍis. Converted into degrees it is 14° 24′. Sine Half Cara is 10.56. This is additive to form Antyā because the Sun is between 0 and 6 rāśis. Therefore Antyā $=43+10.56=53.56$. (iii) The Nata-degrees are 10×6, *i.e.* 60°. The Coversine of this is 21.5. (iv) The hypotenuse related to the shadow at the given time is $12.29+\{21.5\times12.29\div(53.56-21.5)\}$ $=20.53$ aṅg. The length of the Gnomonic Shadow is $\sqrt{20.53^2-144}=16.66$ aṅg. (v) $16.66\times8+7.5\div15$ is the length of the Human Shadow $=9$ human feet and 5.8 aṅg.

(The Time for a Given Shadow measured)

26b–29. The Gnomonic Shadow can be got from the Human Shadow by reversing the operation of getting the latter from the former. Squaring the Gnomonic Shadow, adding 144 and extract-

ing the square root of the sum, will give the related Hypotenuse. This divided by the Mid-day-Shadow-hypotenuse of date is the 'Divisor' of the Antyā of date. Antyā ÷ 'Divisor' = 'Result' (called *Iṣṭāntyā*). Deduct from 'Result' the Half-Cara Sine of date, if the Sun is in the northern hemisphere (*i.e.* from 0 to 6 rāśis); add if in the southern hemisphere (6 to 12 rāśis). Finds its arc in degrees. Divide by 6 and get nāḍis. Add or subtract the Half-Cara-vināḍis of date, as the Half-Cara-Sine is subtracted or added. The nāḍis gone after sunrise before mid-day, or the nāḍis to go till sunset after mid-day are obtained.

Example 31. *At a time of day on date and place given in Ex. 30, the Human Shadow measured by the human foot is 9 – 5.8. Find the Time.*

Follow Ex. 30 from the end. Reversing the operation in (v), $(9 \times 15 + 5.8 - 7.5) \div 8 = 16.66$ aṅg, are the Gnomonic Shadow. Reversing (iv), $\sqrt{16.66^2 + 144} = 20.53$ aṅg. are the related Hypotenuse. 20.53 ÷ 12.29 (*i.e.* the Mid-day Shadow-Hypotenuse of date found in i) is the 'Divisor'. Dividing the Antyā of date got in (ii), 53.56, the 'Result' got is 32.06. Deducting the Half-Cara-Sine 10.56, got in (ii), (as the Sun is between 0 and 6 rāśis), we have 21.5 for which the arc is 30°. Dividing by 6, the nāḍis got is 5. Adding, (because the Half-Cara-Sine is subtractive), the Half-Cara-vināḍis 144 got in (ii), we get 7 nāḍis 24 vināḍis after sunrise or before sunset of date, for the given Shadow.

CHAPTER IV

THE ECLIPSES

(Conjunction)

1–2a. When the Longitude of a body having a slower direct motion is greater, the Conjunction is to come; otherwise the Conjunction is gone. But if both bodies are in retrograde motion, then the Conjunction is gone, and to come, respectively. If one body alone is retrograde, and its Longitude is greater, then the Conjunction is to come, and if less, it is gone.

2b–3a. Find the difference in longitude between the two bodies in minutes. Divide this by the difference of their daily motion in minutes if both are either direct or retrograde; divide by the sum of their motion if one alone is retrograde and the other direct. Days etc. are obtained. (Thus the Time of Conjunction is got.)

3b–5a. In the case of direct motion, add it to the Longitude of the body if the Conjunction is to be, and subtract if the Conjunction has gone. In the case of retrograde motion, subtract and add respectively. The Longitude of the two bodies at Conjunction is got, which, of course, will be equal.

(In short, if the greater longitude is A and the lesser B, and the respective motions a and b, (retrograde motion being treated as negative), and t is the time of Conjunction *to be*, $t=(A-B)\div(b-a)$. The Longitude at Conjunction $=A+at=B+bt$.)

Example 32. *On a certain day, at sunrise, the longitude of the Moon is 5ʳ 11° 50′, and that of Saturn 5ʳ 1° 0′. The Moon's daily motion is 776′ and that of Saturn 4′, retrograde. Find the time of Conjunction, and the Longitude thereat.*

$t=(5^r\ 11°\ 50' - 5^r\ 1°\ 0')\div(-4'-776')=-5/6$ day $=-50$ nāḍis, *i.e.*, the Conjunction took place 50 nāḍis before the given time. The Longitude of the bodies at that time is: $-5/6\times776'+5\ \ 11°\ 50'=5^r\ 1°\ 3'.3$. Or (which is the same,) $-5/6\times-4'+5\ \ 1°\ 0'=5^r\ 1°\ 3'.3$.

(The Ecliptic Elements)

5b–7a. Deduct from the Sun's Longitude at sunrise as many minutes as the nāḍis gone in *Prathamā*, or add as many minutes as the nāḍis to go for the end of the *Parva*. Deduct or add seconds equal to the product of the nāḍis and the excess in minutes of the daily motion over 60′. If the daily motion is less than 60′, use the defect, and add or deduct respectively. The Longitude of the Sun at the end of the *Parva* is got. This will be equal to the Longitude of the Moon, if the *Parva* is *Amāvāsyā*. If it is *Pūrṇimā*, this will be equal to the Moon *plus* 6 rāśis.

7b–8. Multiply the Sun's Daily motion in minutes by 5 and divide by 9. The Angular Diameter of the Sun in minutes is got.

Divide the Daily motion of the Moon in minutes by 25. The Moon's Angular Diameter in minutes is got. The Moon's Angular Diameter multiplied by 5, divided by 2, and increased by 1, is the diameter in minutes of the shadow which hides the Moon (in the Lunar Eclipse).

9. Deduct Rāhu from the Moon, find its Bhujā and the Sine of the Bhujā. Multiply this by 6 and add a 21st part of the result. This is the Latitude of the Moon in minutes. This is positive (*i.e.* South) if Moon *minus* Rāhu is from 6 to 12 rāśis, and negative (*i.e.* North) if from 0 to 6 rāśis.

Example 33. *On a certain day the Sun at sunrise is 70° and its Daily motion 58′. The Moon at sunrise is 65° and its Daily motion 778′. The end of Amāvāsyā falls at 25 nāḍis after sunrise. Find the Sun (=Moon) at that time.*

Adding minutes equal to the nāḍis, we have 70° 25′. The Daily motion is 2′ less than 60′. 2×25 seconds are to be subtracted. So the Sun (=Moon) at the end of Amā is 70° 24′ 10″.

Example 34. *Given the above, find the Angular Diameter of the Sun and of the Moon.*

Ang. Dia. of the Sun $= 58' \times 5 \div 9 = 32'.2$.

Ang. Dia. of the Moon $= 778' \div 25 = 31'.1$.

Example 35. *At the above time, given Rāhu = 72° 24′.2, find the Latitude of the Moon.*

Moon *minus* Rāhu = 11ʳ 28°. The Bhujā of this is 2°. Its Sine is $2 \times 11 \div 15 = \frac{22}{15}$. The Latitude $= \frac{22 \times 6}{15} + \frac{22 \times 6}{15 \times 21} = 8.8 + .4 = 9'.2$. As 11ʳ 28° lies between 6 and 12 rāśis, it is postive (*i.e.* South).

Example 36. *On a certain day at sunrise, the time gone in Pratipad is 15 nāḍis. The Sun is 8ʳ 2°, and its Daily motion 61′. The Moon is 2ʳ 5° 15′ and its Daily motion 841′. Rāhu at the end of Pūrṇimā is 1ʳ 28°. Find the elements for the Lunar eclipse.*

(i) The Sun at the end of Pūrṇimā is $8^r\ 2° - 15' - 15'' \times 1 = 8^r\ 1°\ 44'.8$. The Moon at that time is $2^r\ 5°\ 15' - 841' \times 15/60 = 2^r\ 1°\ 44'.8$.

(ii) The Angular Diameter of the Moon $= 841' \div 25 = 33'.64$.

(iii) The Angular Diameter of the Shadow $= 33'.64 \times 5 \div 2 + 1 = 85'.1$.

(iv) The Latitude of the Moon is found thus :

Moon *minus* Rāhu $= 2^r\ 1°\ 44'.8 - 1^r\ 28° = 3°\ 44'.8$. Its Bhujā is $3°\ 44'.8$. Sine Bhujā $= 11 \times 3°\ 44'.8 \div 15° = 2.75$. $2'.75 \times 6 + 2'.75 \times 6/21 = 16'.5 + 0'.8 = 17'.3$. This is negative (*i.e.* North) because Moon *minus* Rāhu is between 0 and 6^r.

(The Circumstances of the Eclipse: General)

10. Add the Angular Diameters of the eclipsing and the eclipsed bodies, and divide by 2. Deduct the Latitude of the Moon. The remainder is the Magnitude in minutes or Aṅgulas. (If the latitude is greater, there is no eclipse.) If the remainder is greater than the eclipsed body, the eclipse is total.

11–12a. Add the eclipsed and the eclipsing and divide by 2. Square it. Deduct the square of the Latitude from this, and find the square root. Divide this by the difference of the Daily motions of the Sun and the Moon, in degrees. The result are nāḍikās of Half-duration of the eclipse. If instead of adding the eclipsed and the eclipsing, we subtract one from the other and do the work, we get the Half-duration of the total phase.

12b–13a. The end of the Parva is the Middle of the eclipse. Deducting the Half-duration of the eclipse from this, the approximate time of the First Contact or the beginning of the eclipse is got. Adding, the approximate time of the Last Contact or the ending of the eclipse is got.

13b–14a. Deducting and adding the Half-duration of the total phase from the end of the Parva, the approximate times of Immersion and Emergence are got.

14b–15. Take vināḍis equal to half the Latitude of the Moon in minutes, and deduct from it $\frac{1}{6}$th of itself. Deduct these vināḍis from the times of the First Contact and Last Contact and from the times of Immersion and Emergence, if any, if (Moon *minus* Rahu) is in the odd quadrants; add if in even quadrants. The respective correct times are got. In the case of the Solar eclipse, use the Moon's Latitude corrected for Parallax (PCL) here. If it happens, in this case, that the Latitude has changed sign by the Parallax-correction, add for odd quadrants and subtract for even quadrants.

Example 37. *Calculate the circumstances of the Luner eclipse using the elements of Ex. 36.*

The eclipsing body is the Shadow and eclipsed body is the Moon. Their Angular Diameters are respectively 85′.1 and 33′.64. Now, $(85'.1 + 33'.64) \div 2 = 59'.4$. The Latitude is 17′.3. The Magnitude is $59'.4 - 17'.3 = 42'.1$, *i.e.* 42′.1 aṅg. This is greater than 33′.6, the eclipsed body. So there is total phase also.

Eclipsed + Eclipsing ÷ 2 = 59′.4, already found. Its square is 3528.36. The square of the Latitude is 299.29. $\sqrt{3528.36 - 299.29} = 56.8$. The difference of the Daily motions in degress is $(841 - 61) \div 60 = 13$. $56.8/13 = 4-22.2$ nāḍis, is the Half-duration of the eclipse.

The Half-duration of the total phase is found thus: The Difference between the Eclipsing and the Eclipsed ÷ 2 = 25′.7. $\sqrt{25.7^2 - 17.3^2} = 19.0$. Half-duration of the total phase = 19.0 ÷ 13 = 1–27.7 nāḍis.

The Middle of the eclipse is the end of the Parva, *i.e.* 45 nāḍis (of the previous day). The approx. time of First Contact is at 45-00—4-22.2 = 40-37.8 nāḍis from sunrise. The approx. time of Last Contact is at 45-00 + 4-22.2 = 49-22.2. The approx. time of Immersion is at 45-00—1-27.7 = 43-32.3 nāḍis. The approx. time of Emergence is at 45-00 + 1-27.7 = 46-27.7 nāḍis.

The correct times are got thus: $\frac{17.3}{2} - \frac{17.3}{2} \div 6 = 7.2$ vināḍis. As Moon *minus* Rāhu is in an odd quadrant, this is deductive. Deducting from all four times, the correct times are: First Contact: 40-31, Last Contact: 49-15, Immersion: 43-25, and Emergence: 46-21 nāḍis, from sunrise.

(The Circumstances: Special for the Sun)

16-17a. (ii) By the method given in chap. III, find the Sāyana Lagna at the end of the Parva (corrected for Parallax, as given in 19-20a below). Deduct 3 rāśis from this. (This is the *Nonagesimal*). Find the Sine of its Bhujā. Multiply this by 6 and divide by 13. These are minutes for Parallax Correction in Latitude (due to the Ayana); and are positive if the Nonagesimal is from 6 to 12 rāśis and negative otherwise.

17b-19. Multiply the Equinoctial Shadow by 49 and divide by the Equinoctial Hypotenuse. These are Parallax correction in Latitude due to the Latitude of the place, and is always positive. The algebraic sum of the corrections is called *Nati*. (iii) Add the Latitude of the Moon (at Parallax corrected Parva) to this algebraically and note the sign (and direction). This is the Parallax-corrected Latitude (PCL). This is to be used in the case of the Solar eclipse and the Magnitude and Half Duration found. In the lunar eclips Lagna etc. is not done.

20-20A. (i) Find the difference in degrees between the Nonagesimal (at the end of the Parva) and the (Sāyana) Sun. Divide by 6. The quotient gives the mnemonic for Parallax in vināḍis in the following table, (using which the Parallax in vināḍis is to be found). They are: (i) 39, (ii) 78, (iii) 115, (iv) 144, (v) 172, (vi) 192, (vii) 208, (viii) 219, (ix) 227, (x) 231, (xi) 234, (xii) 238, (xiii) 240, (xiv) 240, (xv) 240.

21-23a. (iv) For 12′ of Nati there is the multiplier 2; for 24′ of Nati there is the multiplier 8, and for 36′ of Nati there is the multiplier 18. Multiply the Parallax in nāḍis by the Multiplier and deduct it from the Parallax in nāḍis. This is the Corrected Parallax in nāḍis. If the Sun is greater than the Nonagesimal, deduct this from the end of the Parva. If less, add to

the end of the Parva. This is (the Parva corrected for Parallax, and) the time of the Middle of the Solar eclipse.

23b–24. (v) To the end of the Parva not corrected for Parallax apply the Half-durations and find the times of First and Last Contacts and Immersion and Emergence (as in Lunar eclipse). Correct each time separately for Parallax. The correct times are got.[22]

Example 38. *Given for Pudukkottai, on a certain day, the Sun at sunrise = 10^r 6° 41′.8, the Moon at sunrise = 10^r 2° 46′.5, Rāhu at sunrise = 1^r 5° 1′, the Daily motion of the Sun = 60′.6, the Daily motion of the Moon = 845′, and the Ayanāṁśa 23°, compute the Solar eclipse, the Equinoctial Shadow at Pudukkottai being 2.2.*

I. *The Elements*: From the data given, the end of Parva, *i.e.* Amāvāsya, is at 18 nāḍis after sunrise; the Sun = the Moon at the end of the Parva, is 10^r 7°; and Rāhu, 10^r 5°. The Sāyana Sun at the end of the Parva is 11^r.

The Angular Diameter of the Sun = 60′.6 × 5/9 = 33′.7.
Do. Moon = 845′/25 = 33′.8.
Half the sum of the Diameters = 33′.7.

II. *The Circumstances*: (i) The Sāyana Lagna at the end of the Parva is, using the Rāśimāna of Pudukkottai, 2^r 26° 51′.4. The Nonagesimal = 2^r 26° 51′.4 — 3^r = 11^r 26° 51′.4. The Difference between the Nonagesimal and the Sun = 11^r 26° 51′.4 – 11^r = 26° 51′.4. The Vināḍis of Parallax for this = 144 + 28 × 2° 51′.4 ÷ 6 = 157 vināḍis As the Sun is less than the Nonagesimal, adding to 18 nāḍis, the approx. Parva corrected for Parallax (PCP) got is 20-37 nāḍis.

(ii) The Sun at PCP = 11 0° 2′.6
The Lagna = 3^r 11° 19′
The Nonagesimal = 0 11° 19′
Its Bhujā = 11° 19′
Sine of the Bhujā = 8.3

22. Note that (i) is to be done first, though given later, and then the rest successively.

The Parallax correction for Latitude due to the Ayana $= 8.3 \times 6/13 = 3'.8$, negative (North), as the Nona. is within 0 to 6 rāśis.

The Parallax correction in Latitude for the Latitude of the place given $= 49 \times 2.2/12.2 = 8.8$, positive (South) always. (2.2 is the Equinoctial Shadow and 12.2 is the Equinoctial Hypotenuse.)

(iii) Adding algebraically, the Nati is $+8'.8 - 3'.8 = +5'$, South. The Latitude at this time: The Moon at this time is $= 10 \quad 7° + 845' \times 2\text{-}37/60 = 10^r\ 7°\ 37'$. Rāhu is $10^r\ 5°$. Moon *minus* Rāhu $= 2°\ 37'$. This is the Bhujā also. Sine Bhujā $= 1.92$. The Latitude is $1.92 \times 6 + 1.92 \times 6/21 = 12'$ negative (North), since Moon *minus* Rāhu is within 0 and 6^r. The Parallax corrected Latitude (PCL) $= -12' + 5' = -7'$ (North).

(iv) For 5′ Nati, the Correction for vināḍis of Parallax is $5 \times 2 \times 2\text{-}37/12 = 2$ vināḍis. ∴ The Corrected Parallax is 155 vināḍis. Applying this to the end of Parva, the PCP is = 20-35 nāḍis. This is the Middle of the eclipse. The Magnitude is the Semi-sum of the Diameters *minus* the P C L $= 33'.7 - 7' = 26'.7$. This being less than the eclipsing body, there is no total phase.

(v) The Half duration $= 60 \times \sqrt{33.7^2 - 7^2} \div (845' - 60'.6)$ in nāḍis = 2-31.5 nāḍis. The approximate times of First and Last Contacts, not corrected for Parallax, is 18∓2-31.5 = 15-28.5 and 20-31.5. The correction for First and Last Contacts is $7/2 - 7/6 \times 2 = 2.9$ vināḍis, deductive because Moon *minus* Rahu is in the first quadrant. ∴ the times of First and Last Contacts not corrected for Parallax alone is 15 - 28.5 — 2.9 vināḍis, and 20 - 31.5 — 2.9 vināḍis, *i.e.* 15-26 and 20-29, respectively.

The correct time of First Contact is: The Sāyana Sun for 15-26 is 11^r. The Sāyana Lagna is $2^r\ 12°\ 11'$. The Nonagesimal is $11^r\ 12°\ 11'$. For the difference between Sun and Nonagesimal, 12° 11′, the vināḍis of Parallax is 79. The correction for this already

found (by iv) is 2 vināḍis less and the correction is 77 vināḍis, additive because the Sun is less. ∴ The time of First Contact = 15-26 + 1-17 = 16-43. The correct time of Last Contact: The Sāyana Sun at 20-29 = $11^r\ 0°\ 6'$. The Sāyana Lagna then is $3^r\ 10°\ 35'$. The Nonagesimal is $0^r\ 10°\ 35'$. The difference between Sun and Nonagesimal = $1^r\ 10°\ 29'$. The parallax for this is $192 + 16 \times 4°29'/6° = 203$ vināḍis. Correction to this (by iv) is 2 vināḍis, (less) and the parallax is additive because the Sun is less. ∴ The time of Last Contact = 20-29 + 3-21 = 23-50.

Thus:	First Contact	= 16-43
	Middle	= 20-35
	Last Contact	= 23-50
	Magnitude	= 26′.7

CHAPTER V

HELIACAL RISING AND SETTING AND THE MAHĀPATAS

(Heliacal Rising and Setting)

1–2a. For Mars, direct Mercury, Jupiter, direct Venus, and Saturn, the approx. dates of heliacal setting and rising are 60, 16, 15, 30 and 15 days respectively, before and after the days of the ends of cycles. For retrograde Mercury and Venus they are 50 and 287 respectively.

2b–4a. Mars, Jupiter and Saturn, and retrograde Mercury and Venus, when having longitudes greater than the Sun set in the west, and when having longitudes less than the Sun rise in the east. Mercury and Venus in direct motion, set in the east when less than the Sun, and rise in the west when greater.

4b–5a. The *Kālāṁśa-s* are: For Mars 17°, for Mercury 13°. for Jupiter 11°, for Venus 8°, for Saturn 15°, for retrograde Mercury 12°, and for retrograde Venus 6°.

5b–6a. If the rising or setting pertains to the east, multiply the Kālāṁśa-s by 5 and divide by the Rāśimāna, in nāḍis, of the

Rāśi in which the body is situated. If the rising or setting pertains to the west, divide by the Rāśimāna in nāḍis of the 7th Rāśi from that in which the body is situated. *Kṣetrāṁśas* are obtained.

6b–7. In the case of the east, the Kṣetrāṁśa-s are to be deducted from the Sun, and in the case of the west, added. When this corrected Sun and the body are equal, *i.e.* in conjunction, then is the time of the Heliacal Setting or Rising. Here too, the time is to be found as that of conjunction.

Example 39. *On a certain day at sunrise, the Sun is 9^r 0° 19′.1 and its Daily motion 61′.3. Mars is 9^r 12° 58′.6 and its Daily motion 37′.6. Is it the setting or rising of Mars that is nearby? Find the time, for Pudukkottai.*

Mars being greater than the Sun, its setting in the west is the phenomenon nearby, and is to be calculated.

The *Kālabhāga* of Mars is 17°. Now, $17 \times 5 \div 5\text{-}21$ (this last being the Nirayana Rāśimāna for Pudukkottai of the 7th from the Rāśi in which Mars is situated) $= 15°\ 53'.3$, *Kṣetrabhāga.* Adding this to the Sun, as the phenomenon pertains to the west, we have the Corrected Sun $= 9\ \ 0°\ 19'.1 + 15°\ 53'.3 = 9^r\ 16°\ 12'.4$. The time of Conjunction of the Corrected Sun and Mars $= (9^r\ 16°\ 12'.4 - 9^r\ 12°\ 58'.6) \div (37'.6 - 61'.3) = -8$ days 10.6 nāḍis, *i.e.* the Setting of Mars took place 8 days 10.6 nāḍis before the time taken.

(The Mahāpāta-s)

8. When the Sāyana Moon and the Sāyana Sun are, one in an even quadrant and the other in an odd quadrant, if the sum of their longitudes is 12 rāśis, it is the Dhruva of the Mahāpāta called *Vaidhṛti,* and if the sum is 6 rāśis, it is the Dhruva of *Vyīpāta.*

9–10a. Take the Sun or the Moon, add twice the Ayanāṁśa and deduct it from 6 rāśis or 12 rāśis. When this Result is equal to the other (*i.e.* the Moon or the Sun), it is the time giving the Dhruva of Vyatīpāta and Vaidhṛti respectively.

10b–11a. If the Result is less or more (instead of being equal), divide this by the sum of the Daily motions. Days etc. are got, gone or to come, respectively, for the Dhruva. These Days etc. multiplied by the Daily motion, and deducted or added, gives the longitudes at Dhruva respectively.

Example 40. *On a certain day the Sun is 5^r. The Moon is 11^r 12°. The Daily motion of the Sun is 59′.2 and that of the Moon 780′.8. The Ayanāṁśa is 23°. Find the Pāta, Dhruva, and longitude at Dhruva.*

(i) The Sāyana Sun is 5 23°, and the Sāyana Moon 0^r 5°. As the Sāyana longitudes are one in an odd and the other in an even quadrant, and as the Sun is near 6^r, a pāta of the Vyatīpāta type may happen.

(ii) Let us take the Moon, longitude 11^r 12°. Adding twice the Ayanāṁśa ($=1^r$ 16°), we have 0^r 28°. Deducting from 6^r, we have the Result, 5^r 2°. As the Result is 2° *more* than the Sun, *i.e.* 5^r, the Dhruva is to come. It will come $120' \div (59'2+780'.8)$ days after the time taken, *i.e.* 1/7th day = 8-34 nāḍis. The Moon at Dhruva will be $11^r\ 12° + 780'.8/7 = 11^r\ 13°\ 51'.5$. The Sun at Dhruva will be $5^r + 59'.2/7 = 5^r\ 0°\ 8'.5$.

11b–12a. When the latitude-corrected Declination of the Sāyana Moon in an odd quadrant is greater or less than the Declination of the Sun, then the *Pāta* has gone or is to go, and when the same of the Sāyana Moon in an even quadrant is such, the *Pāta* is to be or has gone, respectively.

12b. In the case when the latitude is greater than the Declination and the Declination is deducted from the latitude, take the Moon in an odd quadrant to be in the even and *vice versa*. (In such a case the Pāta, if there is one, *will be*, if the Moon had been originally in an odd quadrant, and *must have gone* if otherwise.)

13. (In the case when the uncorrected Declination and the latitude are of different directions) if the latitude is greater

than the difference between the Sun's Declination and 1440′, the Pātas will not occur.[23]

Example 41. *Following Ex. 40, find whether the Pāta has gone or is to be, given Rāhu for the time to be 4ʳ 13° 52′.*

For Sāyana Sun, 5ʳ 23° 8′.5, the Declination is 2° 47 North (See III. 21). For Moon 11ʳ 13° 51′.5, and Rāhu 4ʳ 13° 52′, the Bhujā is 60° and the Latitude is 2° 15′ (South). The uncorrected declination is 2° 47′ (North). The Declination of the Moon corrected for latitude is 32′ (North). This being less than the Sun's Declination, and the Sāyana Moon being in an odd quadrant, the Pāta is to be.

Example 42. In Ex. 41, if Rāhu is 1ʳ 28° 51′.5, the latitude would be 4° 21′ (South). The Corrected Declination of the Moon would be 1° 34′ (South). As the uncorrected Declination is less than the latitude, the Moon is supposed to be in an even quadrant, and the Pāta will be.

Example 43. *With the Sāyana Sun 9 5°, Sāyana Moon 2ʳ 25°, and Rāhu 5 25° at Dhruva, will any Pāta occur in its neighbourhood?*

The Sun's Declination is 1434′. The difference from 1440′ is 6′. The Moon's uncorrected Declination is 1434′ (North). Its Latitude is 270′ (South); these two are of opposite directions. At the same time, the Latitude is greater than the difference. So no Pāta occurs.

14–17a. Find the difference between the True Declinations of the Sun and the Moon. (If the Pāta as found in verse 10 is gone, then:) if the Moon is in an odd quadrant, deduct from the difference first the bit of declination due to the degrees left over after dividing the Sāyana Longitude by 5 in finding Declination, next the bit due to the previous 5°, next the bit due to the 5°

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23. This is not strictly true; for, satisfying this condition they may happen, and not satisfying, not happen.

previous to that and so on. Add up these degrees for which the deductions have been made. Find the degrees corresponding to the fraction of declination left over and add this too to the degrees. These degrees are called *Śuddhabhāgas*. If the Moon is in an even quadrant, begin with deducting the bit of declination due to the degrees that will complete the next 5°. Then deduct the bit due to the next 5°, the next 5° and so on, and add up the degrees. Find the degrees corresponding to the fraction of declination left over and add that too. The Śuddha-bhāgās are got. (If the Pata as found in verse 10 is to come, the work for the odd and even quadrants is to be interchanged.) Divide the Śuddha-bhāgas by the Moon's Daily motion[24] in degrees. Days etc. are got. Deduct this from the time of Dhruva if the Pāta is gone, and add if it is to be.

17b–18. Repeat this with the Moon, Rāhu and Sun of this time. The time when the True Declinations of the Sun and the Moon are equal is the Central time of the Pāta, provided that at this time, the Sun and the Moon satisfy the definition.

Example 44. *On a certain time of Dhruva, 0 nāḍikā on 20th Kaṭaka (Āḍi), the Sāyana Sun is* 4^r *12°, the Sāyana Moon* 1^r *18°, and Sāyana Rāhu* 10^r *18°. The Daily motion of the Sun is 58′ and that of the Moon 14° 12′. Compute the time of the middle of the Pāta.*

The Bhujā of the Sun = the Bhujā of the Moon = 1^r 18°. The Sun's True Declination = the Moon's Mean Declination = that for the Bhujā 1^r 18°, *i.e.* $(9\times 5°+3°)=1002'+52'$, North (by III. 20). The Moon's Latitude (by IV. 9) is 270′, North. The True Declination of the Moon is $1054'+270'=1324'$, North. The Moon is in the odd quadrant, and its True Declination is greater than that of the Sun. So the Pāta has gone. The difference in declination is 270′. Working backwards in the Bhujā, which is required in this case, deduct 52′, the part of the declination for 3° left over, from 270′. The remainder

24. If the sum of the Daily motions of the Sun and the Moon is used quicker results will be got.

is 218′. The first part of the Śuddha-bhāga is 3°. Deducting 95′ for the previous 5°, the remainder is 123′ and 5° is added to make up the Śuddha-bhāga. Deducting 98′ for the still previous 5°, the remainder is 25′, and 5° more is added to make up the Śuddha-bhāga. The degrees for the next 25′ of declination, *viz.* $25/105 \times 5° = 1°\ 12'$, to be added. Thus the Śuddha-bhāga is 14° 12′. Dividing by the Moon's Daily motion, the day etc. obtained is one full day. As the Pāta is gone, deducting this from the time of Dhruva, the first approximate time of the Central Pāta is 0 nāḍikā on 19 Kaṭaka (Āḍi).

The Sun for this time is $4^r\ 11°\ 2'$, the Moon is $1^r\ 3°\ 48'$ and Rāhu $10^r\ 18°\ 3'$. For the Sun's Bhujā, $1^r\ 18°\ 58'$, its True Declination is 1070′. For the Moon's Bhujā, $1^r\ 3°\ 48'$, the Mean Declination is 784′, North. Its Latitude is 261′, North. The True Declination of the Moon is 1045′. The difference between the True Declinations is 25′. The Moon being less and in the odd quadrant, the Pāta is to come. For the difference of 25′ to become 0, 25′ in declination has got to be deducted. Corresponding to 25′ declination, next to come, the S'uddha-bhāga = $\frac{25}{105} \times 5°$ $= 1°12'$. Dividing by 14° 12′, we get 5 nāḍikās, 4 vināḍkās. Adding to 0 nāḍikā on 19th Kaṭaka, (Āḍi), (as the Pāta is to come), we get 5 nāḍikās, 4 vināḍikās on 19th Kaṭaka (Āḍi) as the second approximate time of Central Pāta.

Repeating, we get 4 nāḍikās 40 vināḍikās after sunrise on 19th Kaṭaka (Āḍi) as the time of Central Pāta.

19. Add the Angular Diameters of the Sun and the Moon and halve it. Divide this by the difference between the Daily motions of the Sun and the Moon, in degrees. The nāḍkās

etc. of the Half-duration of Pāta are got. Deduct this from the Central Pāta. It is the time of the beginning of the Pāta. Add, and it is the time of the end.[25]

Example 45. From the Sun's Daily motion 58′, its Angular Diameter is 32′, and from the Moon's Daily motion 14° 12′, its Angular Diameter is 34′ (by IV. 7-8). Adding and halving we get 33′. The Central Pāta is at 4-40 nāḍikās on 19th Kaṭaka (Āḍi). The Moon for this time is 1^r 4° 54′. For this region the rate of declination per 5° is the bit 105′ for both works practically. So the Half duration is $\frac{33}{105} \times 5^\circ \div 15^\circ\ 10'$ (15° 10′ is the sum of the Daily motions) = 6 nāḍis, 13 vināḍis, on both sides of the Central Pāta, practically. Deducting from the time of Central Pāta, the beginning of the Pāta is 58-27 nāḍis on the 18th Kaṭaka (Āḍi). The end is 10-53 on 19th Kaṭaka (Āḍi).

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25. The method given in the Text is wrong. The following method analogous to the method of finding the Central Pāta, is the correct one: In the place of the difference between the True Declinations, take the sum of the semi-diameters; and using the Moon of the time of Central Pāta, work (i) as if for the Pāta gone, and (ii) for the Pāta to come, using for division the sum of the Daily motions. Deduct and add these times respectively to the Central Pāta, to get the beginning and the end. A better approximation can be got by using the Sun, Moon and Rāhu of these times and finding the time of Central Pāta each and repeating the work.

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